GAS JOURNAL

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EFFLUENTS DISPOSAL

OUR pages of late have contained many references to the problem of the satisfactory disposal of gas-works effluents. Increased demand for gas has resulted in a considerable increase in the volume of crude liquor and of effluent liquor from concentration plants. In many instances the quantities being discharged into sewers when the 1937 Drainage of Premises Act was passed have since been exceeded. In 1948 the law regarding prevention of pollution of rivers and streams was stiffened, and in July last (*Journal* of July 20), in view of the passing of the River Boards Act of 1948 and the nationalisation of the gas industry, the Institute of Sewage issued a memorandum on the subject. It may be recalled that the memorandum set out four conditions for the acceptance of gas liquor by sewage authorities:—That the area of gas supply should be no greater than the district draining to the sewage works; that wherever possible the liquor discharged should be spent liquor; that consideration should be given to the discharge of liquor so that the maximum amount is received into the sewers when the flow of sewage is at its peak; that the liquor should be free from tar. Commenting on this memorandum we said that the problems as a whole, major and minor, call unmistakeably for co-operation between the gas industry and the sewage authorities, who should be encouraged in the knowledge and belief that they are the friends of gas undertakings rather than their enemies.

There is, of course, need for particular attention to effluent problems in the planning of new works and also in the replanning of old. In the *Journal* of November 9 we published the address which Mr. J. H. Dyde gave as President of the Southern Association of Gas Engineers and Managers, in which he outlined the plan of the Eastern Gas Board, of which he is Deputy Chairman, explaining that in the Eastern area an effluents committee has already been set up to deal with the many difficulties that have arisen. Two chemists (one of whom serves on the Liquor Effluents and Ammonia Committee of the Institution of Gas Engineers) operate from two separate laboratory centres and cover the area divided roughly between the various catchment boards. That is obviously a step in the right direction. And Mr. Dyde mentioned that, in regard to the building of an entirely new works in the area, a site is available which is in all respects desirable except in that of liquor disposal. The matter is, in fact, being held in abeyance pending the results of such pioneer work as is being undertaken now at Tingley. A few weeks previously the Deputy Chairman of the North Eastern Gas Board, Mr. G. E. Currier, was commenting on this pioneer work at Tingley (*Journal* of October 19). On Friday last Mr. J. J. Priestley, of W. C. Holmes and Co., Ltd., presented a paper to the Scottish Junior Gas Association in which he gave particulars of the Tingley complete effluent disposal scheme, which is interesting the whole of the gas industry. It is the most comprehensive scheme of effluent disposal yet suggested. 'It is,' said Mr. Priestley, 'a solution of the problem of effluent disposal from a large new works, sited away from large centres of population, where the cost of treatment by sewage authorities is prohibited.' It is claimed that not only will the plant pay its way but that it will actually show a net revenue in operation. Two such plants are being installed by Holmes, the other one being at Denton, near Manchester.

The novelty of the Tingley scheme is not in the constituent plant units but in the combination of these units. The process is well described by Mr. Priestley, whose paper is, indeed, an important treatise on the effluents disposal problem. We intend to publish it in full in the *Journal*, but we may mention here that crude liquor is treated in a benzole dephenolation plant, and dephenolated liquor is distilled for the production of concentrated ammonia liquor. The still effluent is concentrated to one-tenth of its volume, and the concentrate is washed with butyl acetate for the removal of higher tar acids, after which the concentrate is evaporated for the production of ammonium chloride. Condensed vapours from the evaporation plant pass through an active carbon plant for the final removal of any phenols which may have slipped by. Such condensate can be used as boiler feed water.

Looking at the matter broadly, Mr. Priestley remarks that unless there is an economic gain in the materials discharged as effluents little will be done without legal compulsion. By legal compulsion the situation may be so changed that the discharge of untreated effluent may be more costly than treatment and disposal at the works. Legal compulsion implies that methods of treatment are

available. Above all, as we have stressed previously, practical co-operation must be ensured; and there is much to be said for the author's contention that benefit would be derived from the setting-up of a joint body representative of the gas industry, the Rivers Boards, and the Institute of Sewage Purification for the simplification of the present scales of charges and conditions of acceptance. The problem should be tackled at national level.

BENEFIT OF EXPERIENCE

WITHOUT flattery the Eastern Gas Consultative Council may be congratulated on having a Chairman who combines a lifelong professional experience in the gas industry with a unique range of public activity. Mr. Turner, who retired a month before vesting date from the General Managership of the Bedford group of undertakings—a constituent part of the United Kingdom Gas Corporation—is Deputy Mayor of Bedford, a member of the Bedfordshire County Council, chairman, vice-chairman, or member of several committees of both the Borough and County Councils, a past President of the local Rotary Club, President-elect of the Bedford Chamber of Trade, and holds various other offices. Bearing in mind that the consultative council has no hand, beyond the fact that the chairman is *ex officio* member of the area board, in the administration of the industry, it is fitting that one with such varied interests should preside over a body whose sole concern is to look after the consumers' interests.

At last week's second meeting, a report of which appears on p. 468, the consultative council was confronted with a number of questions on prices, pressures, prepayment versus ordinary meter differentials, and special tariffs, to which the Chairman was able to provide most of the answers. Whatever may be said for or against the now-established fact of nationalisation, it is unfortunate that not only in the eastern counties but throughout the country nationalisation has been blamed for price increases which are, in every instance, based on economic facts that existed long before vesting date. It just happened that in the last year of private and municipal enterprise a number of undertakings did not face up to the unpleasant task of raising prices, although in many cases they were aware of deficits in their revenue figures brought about by increased cost of coal and materials, increased wages, and a fall in the value of residuals, and at the same time were faced with considerable arrears of works and district repairs accumulated during the war. Their reluctance to raise prices was, as Mr. Turner told the council last week, due partly to the fact that accumulated reserves were available to meet deficiencies.

When the council came to consider questions of a more routine character—some of them almost as old as the industry itself—Mr. Turner was able to steer the discussion along helpful lines. Among these matters were insufficient pressure during the peak load period at midday on Sunday; possible economies by arranging for the gas and electricity meters to be read by one man instead of two; and re-arrangement of the relationship between prepayment and ordinary meters so that the large prepayment consumer should not be overcharged while the ordinary consumer is not called on to bear an undue burden in respect of the unprofitable slot consumer. On some of these questions Mr. Turner was able to give the Council a reasoned answer; on others he undertook to approach the area board which, it was reported, had already considered the council's recommendation that the price of gas used specifically for bread baking should be given the best possible terms seeing that the demand was regular and consistent and not seasonal. The board, it was stated, had expressed its willingness to do this. Steps have been taken to set up a divisional committee for each of the five divisions into which the eastern area has been divided. The local authorities in the divisions will be asked to suggest names, and the T.U.C. and other interests will also be represented in proportions corresponding to those on the consultative council itself.

REPRIEVE FOR STEEL

IT is an ironic coincidence that the compromise on the Steel Bill which has effected a postponement of the vesting day from May 1 next year to January 1, 1951, should have been debated in Parliament exactly one year after the introduction of the Bill in the House. On that occasion we commented in these pages that 'arguments applicable to the fuel industries do not, to our mind, bring any conviction in regard to the merits of the nationalisation of steel, albeit steel is without any question a basic industry. The Government, we think, floundered badly, adducing arguments quite beside the point of efficient steel production and distribution, merely pushing nationalisation for the sake of a political doctrine, divorced from the interests of the consumer.' At the same time the Federation of British Industries issued a statement to the effect that the industry was showing a fine record of achievement and efficiency, accompanied by sound labour relations, that there was no evidence that the drastic changes of ownership proposed under the measure would benefit producers, consumers, workers, or the nation. Developments both inside and outside the industry that have taken place since then seem to afford no reason why either we or the F.B.I. should revoke in any way the opinions expressed a year ago. Steel production achieved yet another record in October when output of ingots and castings reached an annual rate of 15,959,000 tons.

In view of this achievement, Mr. Aneurin Bevan's recent comment to the steel masters—'your ownership of the steel industry has as much relevance to the modern world as the bow and arrow has to modern warfare'—only makes more cogent our former criticism of the Government's policy for its political partisanship. The Government amendments to the Bill, which were accepted on both sides of the House last week, in effect yield the case argued by the Conservative and Liberal Peers in the House of Lords. The general election will now take place before the vesting day and also before any member of the corporation for the nationalised steel industry can be appointed; the electorate will decide the issue next year when the Act as it stands will be before them. The Government has made this concession to the realities of the present political situation. Meanwhile the President of the Iron and Steel Federation has said: 'The iron and steel industry, while reaffirming its unanimous opposition

to the Iron and Steel Nationalisation Bill, welcomes the Government's decision to postpone action under the Bill. It provides for all shades of opinion an opportunity to think carefully over the grave implications of changing the basis of operation of the steel industry.'

BUILDING EXHIBITION

THE Building Exhibition has travelled a long way since its humble beginnings in 1880, when coconut shies and hoop-la stalls outnumbered the legitimate exhibits. And when this element was refused permission in 1895 there were less than 100 stands, as opposed to nearly 500 today. There were no sideshows at Olympia when the 1949 edition was opened on November 17—a fact to be regretted in some ways as they would have provided a welcome relief to the dulness of certain semi-official exhibits. There is little doubt that, taken by and large, private enterprise is the lifeblood of exhibitions: Government sponsored exhibits, for all their aesthetic excellence, do not excel in liveliness. Regarding the fuel industries, we were relieved to find that public ownership has not greatly impaired their flair for publicity. We think visitors will agree that the Gas Council's stand is a good job of work; it is pleasantly designed, is wide in scope, and has plenty to interest the architect and builder. It may be a trifle too large, but it is more than a match for its electrical counterpart, despite the considerable publicity given to certain electrical appliances (notably water heaters) at this exhibition. The dark horse of the show is solid fuel. The marked improvement in technical efficiency, in appliance appearance, and, in particular, propaganda sense during recent years, stands out and warrants our attention.

In its other aspects the exhibition reflects the changing conceptions of building practice, the development of traditional methods, the increase in mechanisation and prefabrication, and the introduction of 'new' materials, some of them remarkable like plastics and glass wool, some regrettable, like the ersatz members of the fibre board family. The accent is clearly upon economy, notably steel and timber, and the desirability of exporting rather than importing. One welcome feature of this exhibition is the increased use made of skilled architects in designing individual stands, a practice which throws into sharp relief the exhibits which follow the usual humdrum pattern. However, there is a danger that the newer approach will produce a stand which, although possessing value as an ingenious and harmonious creation, nevertheless fails to attract visitors. To our mind the E.D.A. exhibit has this dubious quality, while the Gas Council's display has achieved a happy marriage between the artistic and the utilitarian. By all means have an information bureau, but it will not fulfil its purpose unless enquirers are attracted to the stand by a curiosity-provoking display.

IF WINTER COMES

THE Gas Consultative Councils are not, under the terms of their appointment, concerned with anything but gas, but we are glad to note that at least one Chairman—Mr. A. W. Loveys, of the South Western—has recognised the importance of bearing coke also in mind and has written to the Press throughout the area a letter drawing attention to a situation which, with a little foresight on the part of coke users, can be prevented from reaching serious proportions. The situation in the south-west is common to all the areas, and we quote from the letter not because it is likely to have any direct effect but because other consultative council chairmen or members might deem it appropriate to disseminate the same message. Ample stocks of coke, says the letter, are held by most gasworks, and supplies at present are sufficient to meet all requirements. The present allocation to householders is three tons per annum, which can be taken at any time, but the quantity taken into stock during the summer months this year has been very much less than in previous years. It follows that if the winter should be severe it will be impossible to find transport sufficient to cope with the demand, and many homes may in consequence be without supplies. Some householders may not have the capacity to carry large stocks of fuel, but it is incumbent on those who have to ensure that they take full advantage of the position at present by placing orders for coke now and so assist in avoiding a crisis later on.

SOUTH WESTERN ENTERPRISE

THE postponement of the increases in the price of gas in the South Western area has aroused an unnecessary amount of discussion. Whatever may be the legal differences between the area board and its consumers it is obvious that revenue must be made to balance expenditure, and sooner or later the consumers will have to pay an economic price for the service they receive. Meanwhile, as Mr. A. W. Loveys told the South Western Gas Consultative Council last week, the board is tackling its responsibilities with energy and determination. Already economies totalling roughly £100,000 in a full year have been secured by bulk buying, and schemes are in hand for new plant and improved services which in the case of Bath and Bristol alone will cost over £2 mill. Prices and hire-purchase terms for gas appliances are being standardised, and consideration is being given to standardised meter rents and the development of a promotional tariff. The board is responsible for gas supplies through 112 undertakings, most of them small, over an area of 8,000 sq. miles, and to facilitate the inspection of modern appliances by consumers in remote rural areas and small towns the board has inaugurated an attractive mobile showroom, described and illustrated elsewhere in this issue. The vehicle is designed with special regard to maximum floor space for display and accommodation for callers, spacious headroom to enable correct installation, improvement of ventilation, and avoidance of excessive temperature, distinctive exterior, and low capital, repair, maintenance, running, and other costs. Starting from Bristol, the mobile showroom will tour the northern half of the area and will later make its appearance in the southern half. Its progress and results will be followed with interest.

Letter to the Editor

SULPHUR IN SPENT OXIDE

DEAR SIR,—In reply to the letter of Mr. H. F. Taylor which you published in the *Gas Journal* of November 9, I would like to say that during our numerous laboratory experiences no accident has ever occurred in using the method I described in the *Journal* of October 26 for extracting sulphur from spent oxide. I would emphasise that all our evaporations were directly followed by recondensation. Consequently the atmosphere above the mixture of ether and sulphur is not air (an oxidising atmosphere) but an atmosphere of ether-vapours, and when the ether comes to the air, it is cold and without sulphur.

This fact could perhaps explain the lack of explosion in our experiences.

Yours faithfully,

L. FASSINA.

Laboratoire du Manganese du Centre National de la Recherche Scientifique.
61, rue de Buffon,
Paris, Ve.
November 14, 1949.

Personal

Mr. **George Clark** has resigned from the Board of B.H.D. Engineers, Ltd. Messrs. **Lewis Seaman, A. A. Smith,** and **S. G. Watson** have been appointed Directors.

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Mr. **Leslie Hardern,** Public Relations Officer of the North Thames Gas Board, has been re-elected Chairman of the National Council of the Design and Industries Association.

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Alderman Mrs. **R. Hodson,** a member of the East Midlands Gas Consultative Council, has been appointed Deputy Chairman of the Council. Councillor **F. Fisher** (West Bromwich) has been appointed a member of the West Midlands Gas Consultative Council.

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Mr. **Sam Gale** has just completed 50 years at the Newark Gasworks and in honour of the occasion his fellow workmen have presented him with a smoker's cabinet. Mr. Gale's family has now given nearly 150 years' service to the gas industry. His father contributed 42 years to the family total, and his two brothers have so far seen 36 and 21 years' service, respectively. Mr. Gale started with the then Newark Gas Company in 1899 at 13 years of age and has risen to the position of works foreman. He has seen the daily output of gas grow from 50,000 cu.ft. to a record of over 1 mill.

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Air Vice-Marshal **C. A. Bouchier,** C.B., C.B.E., D.F.C., has been appointed representative of the Federation of British Industries for Japan. It is intended that he will make two visits a year and he left on November 18 on his first trip which will last three or four months. He will investigate openings for British exports to Japan and report on post-war industrial development in that country. Since August, he has been in consultation with British industries having special interest in Japanese trade. Until 1948, Air Vice-Marshal Bouchier was Deputy Commander-in-Chief of the British Commonwealth forces in Japan.

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Mr. **Harold Robinson,** Engineer and Manager of Annan gas undertaking, in the Kilmarnock Group, South Western Division of the Scottish Gas Board, will retire on November 30. He received his training with Carlisle Corporation Gas Department. He was then appointed Manager to Sedbergh Gas Company, Yorkshire, and later returned to Cumberland to take over the management of Wigton Gas Company. On the resignation of Mr. M'Gill in 1917 he was appointed to his present position at Annan. At that time the output of gas was 18 mill. cu.ft. per annum ; today it is almost 50 mill. cu.ft. per annum. During the war he was appointed by the Ministry of Fuel to the Advisory Board for the West of Scotland. He was co-opted a member of Annan Town Council for four and a half years.

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Mr. **R. S. Ramsden,** General Manager and Engineer of the Leamington Spa District undertaking of the West Midlands Gas Board, will retire this month. Mr. Ramsden has been in charge of the undertaking, formerly known as the Leamington Priors Gas Company, since 1918, when he succeeded the late Mr. Thomas Berridge, M.I.C.E., J.P. He entered the gas industry as a pupil of, and then Engineering and General Assistant to, his father, the late Mr. F. L. Ramsden, who was Engineer and Manager of the Burton gasworks. Following his father's death in 1906 he was appointed Manager and later, in 1916, Manager and Engineer of the undertaking. He was elected a member of the Institution of Gas Engineers in 1909, and has been successively President of the Midland Junior Gas Association (1910), President of the Midland Association of Gas Engineers and Managers (1934), and Chairman of the Midland Commercial Gas Association (1938). Mr. Ramsden will be succeeded at Leamington by Mr. **D. K. Green** who has been Engineer and Manager of the Stratford-on-Avon undertaking for the past three years. Mr. Green, a former pupil and engineer-supervisor with West's Gas Improvement Co., Ltd., was previously Engineer and Manager of the former Leek Gas Department, a position to which he was promoted following his appointment as Assistant Gas Engineer at Leek in 1933.

Mr. **R. Talbot Clayton** has for health reasons resigned from Cannon Iron Foundries, Ltd. Mr. Clayton, whose father, Richard Clayton, a late Managing Director, was connected with Edward Sheldon, founder of the firm, served the Company for many years. Mr. **G. A. Vernon** and Mr. **G. A. Oatley** have been elected Directors of the Company. Mr. G. Vernon will continue to hold the position of General Sales Manager. Mr. G. A. Oatley, who served in the Far East as Captain with the 8th Batt. Gurkha Rifles Regiment, joined the Company on demobilisation and was later appointed assistant to the Chairman, Mr. A. F. Oatley.

Obituary

Mr. **Joseph Frederick Lord,** General Manager of the Kettering undertaking, died suddenly on November 10, at the early age of 47. He was appointed General Manager and Secretary to the Kettering Gas Company in December, 1944. Mr. Lord served his apprenticeship with West's Gas Improvement Co., Ltd., Manchester. In 1924, after serving them as Clerk of Works on a number of installations, he was engaged by the Northampton Gaslight Company to supervise the erection of an extension of its carbonising plant on the completion of which he was retained as Carbonising Engineer. In 1929 he was appointed Engineering Assistant at Darlington and later promoted to the position of Deputy Gas Engineer from which he went to Kettering. That Mr. Lord was highly esteemed by his colleagues in Northamptonshire, by the townspeople of Kettering, and by those who worked under his direction, was shown by the large and representative gathering who attended his funeral on November 14. He leaves a widow, a son, and two daughters.

Diary

Nov. 24.—North Thames Gas Consultative Council, St. Ermins Hotel, Westminster, 2.30 p.m.

Nov. 25.—Eastern Association of Gas Engineers and Managers: Autumn General Meeting, Waldorf Hotel, London. Presidential Address, C. E. Grimwood.

Nov. 29.—Midland Junior Gas Association : Meeting, Birmingham. 'Carburetted Water Gas,' S. C. Crathorn (Birmingham).

Nov. 29.—Southern Association of Gas Engineers and Managers (Eastern District): Technicolour Film, 'Mechanical Handling,' with introductions by S. Langford (Robert Dempster & Sons, Ltd.), and W. G. Picton (International Combustion, Ltd.). Gas Industry House, 2.30 p.m.

Nov. 29.—Bristol Association of Engineers: 'Britain's Energy —A New Conception,' Sir Claude Gibb, C.B.E., F.R.S., Bristol University (Physics Lecture Theatre), 6 p.m.

Nov. 29-30.—Institution of Gas Engineers. 15th Autumn Research Meeting, Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1; 10 a.m. each day.

Nov. 30.—Women's Gas Council (Headquarters Members): 'Fashion in Design,' Miss Audrey Withers, Editor of *Vogue*. Gas Industry House, 3 p.m. Miss Ellington Wright, M.B.E., Chairman. Mr. Leslie Hardern, Public Relations Officer, North Thames Gas Board, will open the discussion.

Nov. 30.—Royal Institute of Public Health and Hygiene : 'The Need for Smoke Abatement,' Sir George Elliston. Lecture Hall, 28, Portland Place, W.1. 3.30 p.m.

Dec. 1.—Demonstration of Infra-Red Cooking by Gas, Radiant Heating, Ltd. Sponsored by the Earl of Limerick, K.C.B., D.S.O., Building Centre, Conduit Street, W.1. 5 p.m.

Dec. 3.—Scottish Junior Gas Association (Western District): Joint Meeting with Eastern District. Paper by A. F. Cottrell (Woodall-Duckham Company), Edinburgh.

Dec. 6.—South Eastern Gas Consultative Council, 4-6, Wandsworth Road, S.W.8, followed by visit to Greenwich works of the South Eastern Gas Board.

Extensions at Mossley

New Plant Opened

Extensions consisting of a new bench of 10 horizontal retorts and three purifiers at the Mossley gasworks were recently opened by Mr. A. Henshall, Deputy Chairman of the North Western Gas Board. The new plant will increase gas production by 1 mill. cu.ft. a day, giving a daily output for the works of 2,750,000 cu.ft. It has been installed to cope with a gas demand which has doubled in the Ashton, Mossley, and Saddleworth area since 1939.

The official group at the opening of the new plant at Mossley. On the extreme left are Mr. A. Walker Smyllie, Public Services Officer, and Mr. W. Hodkinson, Chief Technical Officer, of the North Western Gas Board. The five in the centre of the front row are (left to right) Mr. H. Butters, member of the Board; Mr. R. B. Foster, Mr. A. Henshall, Deputy Chairman; the Mayor of Mossley; and Mr. G. Stevenson, Long Eaton.

At a luncheon following inspection of the works, Mr. **Henshall**, replying for the North Western Gas Board to a toast by the Mayor of Mossley (Councillor **N. Brookes**), said the intention was not only to meet the increasing demand for gas in the Mossley and Saddleworth district, but to replace the water gas plant 'which would have operated at Ashton for some time to come, and release that plant for good work elsewhere.' The undertaking at Mossley, he added, was at the most Northern tip of what was to be called the North Cheshire Group, embodying 10 undertakings from Mossley in the North to Macclesfield in the South.

A welcome to guests and visitors was given by Mr. **H. Butters,** a member of the board, who made a special appeal for continued interest by local corporations in the gas industry. 'I certainly hope they will not think nationalisation means the end of that interest and we of the board will, at all times, welcome their comments or criticisms,' he said.

Mr. **G. Stevenson,** Long Eaton Undertaking, said he was satisfied that the Mossley works and the extensions would give great service to the North Western Gas Board and to consumers in the district. The board's success, he thought, would be in proportion to the extent to which they did not abrogate the policy of decentralisation. By that he meant that the man on the job should be consulted for technical and other advice on every possible occasion.

The contractors for the new plant were:

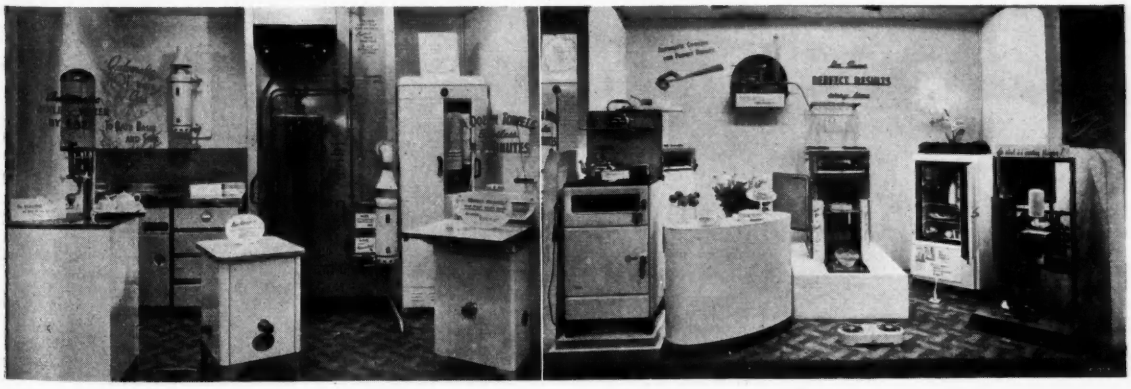
Retort settings and iron work.—Gibbons Bros. Ltd., Dibdale Works, Dudley.

Reinforced concrete work.—Holst & Co., Ltd., Rostrum House, 43, St. Paul's Street, Leeds.

Purifiers.—Kirkham, Hulett & Chandler, Ltd., Union Foundry, Mansfield.

Compressor.—The Bryan Donkin Co., Ltd., Chesterfield.

Cooking meat at temperatures lower than are customary has, after considerable test, proved to give excellent results, especially with tough or very lean meat, poultry, or game. We are therefore interested in a booklet just published by Radiation Ltd. This booklet, under the title 'Low Temperature Meat Roasting,' gives the results of work done on the subject in the firm's research kitchen for those users of New World cookers who wish to try this method. It is explained that meat roasted in this way will require one-third more time than the usual period of cooking, but that there is marked economy in gas consumption. Included in the booklet is a selection of complete menus with recipes which can be cooked in this way, an advantage of which is saving in food shrinkage.



The Ideal Homes Exhibition at Newcastle-on-Tyne attracted 55,000 visitors. The display of the Newcastle Division of the Northern Gas Board was divided into three sections: space-heating, cooking and refrigeration, and water heating and home laundry. Several innovations in presentation were introduced which attracted remarkable attention. The theme behind the whole display was the automaticity of gas. In the cooking section this was demonstrated by a complete cooker on raised platform with the door open. From the oven emerged every three seconds a series of cakes and savoury dishes. A model hand turning the dial of a thermostat was suspended near this special cooker denoting 'finger-tip' control of heat. In the water heating section, the ease of obtaining boiling water was demonsrated and there was a complete working exhibit demonstrating how constant hot water can readily be obtained in the average domestic home by an automatic gas circulator. Our photograph shows the cooker and the water heating sections.

SALESMEN AT SMITH METERS, LTD.

A party of 27 members of the Home Counties (Western) Salesmen's Circle visited the works of Smith Meters, Ltd., on November 8. Commencing their tour of inspection at the Company's Kennington works, the visitors were later transported to the main works at Streatham, where they were entertained to lunch and tea. Our photograph shows, third from the right, Mr. W. Bannister (Oxford), Secretary of the Circle, and, fifth from the right, Mr. Norman Smith, Chairman of Smith Meters, Ltd.

Mechanical Handling

A meeting of the London and Southern Junior Gas Association was held on November 11 in the lecture theatre of the North Thames Gas Board at 178/80, Edgware Road, W.2, when the film 'Mechanical Handling' was shown to the members. The film, which has been sponsored by the Mechanical Handling Engineers' Association with the object of demonstrating the wide possibilities of the use of mechanical means of moving goods in industry, was introduced by the President, Mr. A. H. Savill, M.SC. He said that the film was divided into four sections describing equipment applied to specific uses and covering coal and ash handling, bulk material handling, ferrous and non-ferrous handling, and industrial handling. Of these the first was of particular interest to the members, but it was felt that in each section the audience would find something of interest and value, and it was therefore decided to show the complete film. The President welcomed Mr. John Byrd who produced and directed the film on behalf of Mobile Cinema Services, Ltd.

The film, which is in colour, provided in the coal and ash handling section a logical and thorough description of the handling sequence in gasworks and power stations. The journey of coal was followed from the pit to the users' works and its discharge by means of wagon tipplers of the rotary or side discharge type, and by grabbing cranes. The different methods of conveying the coal to the processing plant were then demonstrated, including the use of bucket conveyors, rubber belt conveyors, and skip hoists. Methods of storing and reclaiming by means of transporters, grabbing cranes, and drag scrapers then followed, and the section concluded with an account of the extraction and disposal of ash, and the discharge, quenching, and conveyance of coke to the screening plant and finally to the storage bunkers.

The film will be shown at other association meetings this year.

The Contract for the erection of a new gasholder at the Jarrow gasworks of the Northern Gas Board has been given to the Oxley Engineering Co., Ltd. The holder will be all-welded and have a capacity of 3 mill. cu.ft.

At a Meeting of professional engineers in Manchester on October 28, convened by the Engineers' Guild, it was agreed to establish a North Western Branch of the Guild with headquarters in Manchester.

Plans have been Approved by the Scottish Gas Board for alterations and additions to Dunfermline gasworks. These include alterations of the meter house and an additional storey for a laboratory, at a cost of £5,500.

A Decision by West Hartlepool Corporation to fit half of its new houses with gas and half with electricity has now been rescinded. Houses will be built with both services and tenants will be able to choose the service they prefer.

Coal Output last week at 4,467,700 tons was 53,700 tons lower than the previous week's record total for 1949, but it was still the third highest production this year. Manpower declined during the week ended November 5 by 500, all face workers, to 708,600. New record figures for output per manshift were recorded—3.12 tons at the face and 1.21 tons altogether. Gas available at gasworks for the week ended November 11 amounted to 11,134.9 mill. cu.ft., compared with 11,351 mill. cu.ft. in the previous week, and 1,000 mill. units of electricity were sent out for public supply, compared with 992.7 mill. units, over the same period.

Compensation Values

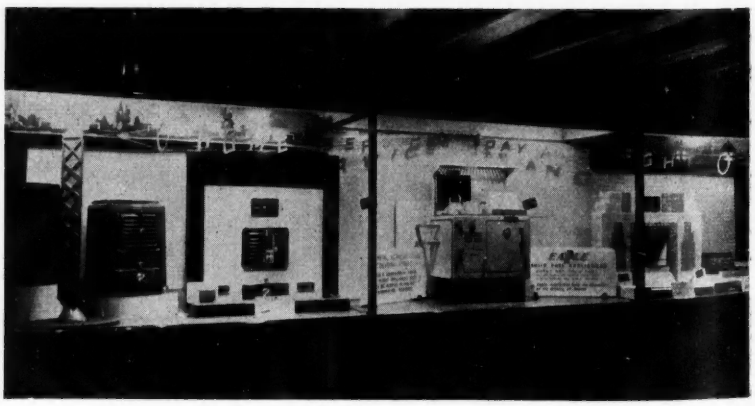
Two errors occurred in the Gas Light and Coke Company's compensation values published in the *Journal* last week. The list should have read:

Security	Value
3½% Red. Pref., 1979 (£100 unit) ...	£104/5/-
4% Cons. Pref. (£100 unit)	£105/10/-
3½% Max. (£100 unit)	£95
Ord. (£1 unit)	26/6

HOME SERVICE DAY AND NIGHT

Many thousands of passengers hurrying through the main subway of Temple Meads Station, Bristol, have daily been attracted by two flashing beacons in the Metal Agencies Company window display, which carried the message 'Home Service Day and Night.'

This message emphasised the features of continuous burning, cleanliness, and comfort in the home of the Eagle solid fuel domestic appliances on show.



The display of solid fuel appliances comprises (left to right) the Eagle controlled combustion stove, the Eagle Advance No. 31 range, the Sutton all-night burning grate, in setting, and the Fulham grate.

To sustain interest and attention of passengers, always in a hurry, in a show case 27 ft. long, needed careful planning and designing of the display. This was done by the Advertising Department of the Eagle Range & Grate Co., Ltd., in co-operation with the Metal Agencies Company of Bristol and resulting enquiries received have more than justified the work involved.

New Coke Plant at Thornton Cleveleys

Sufficient to Satisfy all Consumers

NEW coke grading and storing plant at the Thornton Cleveleys works of the North Western Gas Board was formally inaugurated on November 4 by Councillor C. Hampton, J.P., Chairman of the Thornton Cleveleys Urban District Council and until vesting day Chairman of the Council's Gas Committee.

The plant was constructed by the Saxon Engineering Co., Ltd., of Fenton, Stoke-on-Trent, from a specification prepared by the Engineer and Manager of the Thornton Cleveleys undertaking, Mr. R. B. Garside, and consists of a receiving hopper fed from a night storage hopper, rotary feeder, spaced bucket elevator, grading screen, storage bunkers, with bulk loading and bagging chutes.

The coke is delivered from the retort house by bogie to the receiving hopper, situated 28 ft. above yard level, from which it flows by gravity to a rotary type feeder which delivers the coke to the elevator buckets. The feeder is driven through a chain and sprocket drive from the elevator tail shaft. The receiving hopper and chute are lined with blue Staffordshire tiles to preserve the steelwork from the abrasive action of the coke.

Elevators and Screens

The totally-enclosed elevator has a 5-ply 14 in. rubber belt fitted with spaced buckets running at approximately 100 ft. per minute and is capable of dealing with seven tons of run of retort coke per hour. Coke is delivered by the elevator via a tile-lined steel chute to the coke grading screen situated above the storage bunkers.

The grading screens are the single-deck reciprocating type designed to grade the coke into four sizes for storage in the bunkers below. The screens are of the latest design, whereby perfect balance is obtained and vibration to the supporting structure eliminated. The coke sizes vary from 0 in. to over 2 in.

A 10 h.p. continuously rated slip ring gasworks type motor drives the coke cutter, which in turn by means of a counter shaft drives the grading screens. The elevator drive is by means of a 3 h.p. motor and chain drive. The same motor also operates the rotary feed.

Bunker Capacity

The graded coke, after leaving the screens, is stored in the steel-framed, brick-panelled bunker, the four compartments having a total capacity of 90 tons. The bunker bottom is constructed of mild steel plates suitably stiffened and lined throughout with 1 in. thick blue Staffordshire tiles.

Four bulk loading chutes with radial-type cut-off doors are provided for the direct filling of road vehicles under the hoppers, and four chutes with hand-operated slide doors are provided for the filling of bags on a platform at lorry level. All chutes are lined with blue tiles.

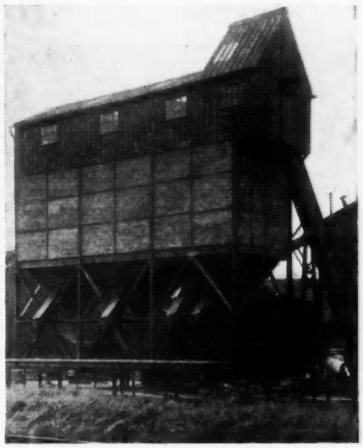
Steel staircases with protective hand-railing provides access from yard level to the timber platform around the grading screens. A steel-framed sheeted housing, with adequate roof lighting and easy clean windows, is provided over the coke grading plant.

Present at the ceremony were Councillor H. Butters, full-time member of the North Western Gas Board, Mr. J. W. Rodgers, Sales Division Officer of the North Western Gas Board, together with engineers and managers of neighbouring undertakings, members of the staff and representatives of the Saxon Engineering Co., Ltd. The ceremony was followed by a luncheon at the Regal Hotel, Cleveleys.

Mr. **J. R. Wylde,** Clerk of the Thornton Cleveleys Urban District Council, proposed the toast of the North Western Gas Board, and stressed the importance of maintaining the closest co-operation between the local authorities and the board.

Councillor **H. Butters,** who replied, referred to co-operation between the area board and the consumers of each undertaking.

Mr. **R. B. Garside.** Engineer and Manager, proposed the toast of the contractors and praised the Saxon Engineering Co., Ltd., for their good work on the plant and the expeditious manner in which they had constructed and erected it. They received the contract in December, 1948, and the plant was at work in less than 11 months.



View from the railway of the new coke grading plant at Thornton Cleveleys.

Mr. **T. Hough**, Chairman of Bennis Combustion, Ltd., parent company, representing Saxon Engineering Co., Ltd., responded, and drew attention to the importance of the correct preparation of fuel for the particular purpose for which it was required.

Mr. **F. Craven,** Showroom and Sales Manager, Thornton Cleveleys, proposed the toast of the visitors and thanked the engineers and managers of neighbouring undertakings for their attendance.

Mr. **T. R. Cook,** Engineer and Manager, Blackpool, replied and mentioned that the Fylde area now had suitably graded coke of varying qualities which was sufficient to supply the needs of every consumer, and the new plant would be a welcome addition to the Fylde amenities.

BURY ST. EDMUNDS TRADE FAIR

The Ipswich Division, Bury St. Edmunds District, exhibits at the Bury Trade Fair, held recently in the Corn Exchange and Athenæum, were among the most popular features of the fair. During its three days' run, 17,000 people attended and the interest shown in the working appliances on the gas stand was excellent. All the water heating appliances were alive, as also were several of the other types of apparatus on show, and the compact and easily demonstrated gas circulator unit came in for considerable attention. The keynote of the display stand was the number of working appliances suitably displayed in a restricted floor space (16 ft. by 8 ft.), the maximum allowed by the Committee. The success of the display has resulted in an endeavour to arrange for a week's exhibition on a larger scale for 1950 in the Abbey Gardens.

Guardians of the Consumer's Interests

Eastern Consultative Council Deals with Criticisms

THE second meeting of the Eastern Gas Consultative Council was held at Gas Industry House on November 14, under the Chairmanship of Councillor R. Turner (Bedford). The resignation of Miss M. A. Pollard (nominated by the Huntingdon Rural District Council), consequent on her removal from the area, was announced, and the Chairman welcomed a new member, Alderman Mrs. M. C. Irving, an ex-Mayor of Tottenham (nominated by the Association of Municipal Corporations).

Long Term Policy

The **Chairman** reported that all the Members of Parliament in the area, Clerks of County Councils, local authorities, and other interested parties had been informed of the appointment and functions of the consultative councils and considerable interest had been shown. Captain C. Smith, M.P. for Colchester, had enquired whether the council had considered any development plan for the whole area, aiming at economy through larger scale operation; to which he had replied that he understood the area board was obtaining information from the districts with a view to the development of a long-term policy. Major Burke, M.P. for the Isle of Ely, noted that some undertakings had shown deficits in the last year of their operation under company ownership because they had not increased the price of gas, although the cost of coal and other materials, and of wages, had risen. Were there, he asked, any grounds for the allegation that this inaction was attributable to the imminence of nationalisation. The Chairman had replied that several companies and committees had considered increases sometime before vesting date; their decision not to make the increases was due in part to the fact that accumulated reserves were available to meet deficiencies if necessary. Price-raising was always an unpleasant proceeding, particularly so in the case of sliding scale companies. Prices were pegged by the Government in 1941, and could be raised only with the consent of the Ministry. The Gas Charges Order of 1947 empowered undertakings to raise prices to meet increased coal costs only.

Joint Meter Reading

Another letter was from Dr. Stephen Taylor, M.P. for Barnet, who enquired whether it would be possible in the interests of economy for electricity and gas meters to be read by the same men. To this the Chairman said he had replied that such a novel suggestion would need consideration. It might be possible if only ordinary meters were used, but he thought difficulty would be encountered where cash had to be collected from prepayment meters. There was also a question whether the gas man could answer the housewives' difficulties about electricity, and *vice versa*. He had, however, forwarded the suggestion to Mr. Bennett, his opposite number as Chairman of the Eastern Electricity Consultative Council, for his comments.

Mr. **W. H. Rogers** (Colchester) suggested that another complication might be a difference in the rates of pay. There was separate negotiating machinery for gas and electricity employees.

Prepayment Differential

Complaint was made on behalf of a Colchester housewife of the extra charge made to prepayment consumers. In the course of a general discussion, the Chairman said that the small differential in the price of gas was more than neutralised where the consumption was small, but he agreed that where there was a substantial consumption the consumer was handicapped by having to pay 1d., 1½d. or even more per therm above the ordinary meter rate. Some years ago the differential was entirely abolished at Bedford, where it was felt that they should charge no more for prepayment than for ordinary meter consumption. He had already expressed his view to the area board and he felt the whole question would have to be considered. It was a common occurrence for consumers, after using prepayment meters for a few years, to express a wish to change to ordinary meters. Owing to the cost involved the gas industry rather discouraged such changes during the war years. Some companies were old-fashioned enough to charge up to £2 or £3 deposit for the installation of the quarterly meter.

Suggested Rebates

Other members of the council pointed out that there was some justification for the differential when the slot meter came into fashion 50 years ago, but the position had changed considerably since the beginning of the first world war. It was suggested that a carefully planned system of rebates would meet the case of the large prepayment consumer. It was felt that some uniform scale should be adopted throughout the area, as the practice varied from place to place at present. The council was of the opinion that the ready-money consumer should be encouraged and felt strongly that when the fixed charges for meter hire and other things had been met the price of gas through a prepayment meter should be the same as that through an ordinary meter.

Bread Baking

Another complaint came from a Chelmsford housewife and related to insufficient pressure, particularly during the Sunday peak cooking load period. The Chairman had taken this question up with the board who had explained the difficulties of carrying out mains extensions, which had got into arrears owing to the war. The pressing demand for gas mains to be laid in new housing estates had to be given priority, but the matter would receive early attention.

A report was submitted by a sub-committee which had considered protests against recently-announced increases in the price of gas at Peterborough. The increases had been announced before the consultative council was properly constituted, but the sub-committee, having considered a budgetary statement as to the estimated deficiency on the undertaking, had endorsed the Chairman's action in approving the increase which amounted in the case of the block rate tariff to 3d. per therm and in the case of 10 industrial consumers who had not sustained a halfpenny increase in November, 1947, 3½d. per therm. Special terms were approved for central heating and bread baking.

The **Chairman** told the council that the area board had considered the council's recommendation that the price of gas used specifically for bread baking should be given the best possible terms, seeing that the demand was regular and consistent, and not a seasonal one. The board had expressed its willingness to do as requested.

Divisional Committees

The council approved a draft scheme for the setting up of divisional committees for each of the five divisions into which the Eastern area had been divided. Each divisional committee will consist of not less than seven nor more than 14 members, of whom from half to three-fourths will be members of local authorities, the rest, appointed by the council, representing commerce, industry, labour and the general interests of consumers. On the suggestion of Mr. W. H. Rogers it was agreed that a nominee of the appropriate unit of the T.U.C. should be appointed to each committee not already having a labour representative.

Mr. **W. G. A. Gardiner** (Ipswich) drew attention to differences in hire-purchase terms between gas and electricity. The electricity people, he said, were putting out cookers at 1s. 8d. per week over a period of seven years, while the gas undertaking was charging 3s. 4d. per week for two years. He suggested that generally speaking a gas cooker was likely to last much longer than an electric cooker.

The **Chairman** promised to look into the matter.

Attention is drawn to the issue by the Institution of Gas Engineers, within the next few weeks, of a second printing of 'Gasworks Effluents and Ammonia' by Arthur Key, D.SC., PH.D., Research Chemist, Institution of Gas Engineers. (Price 13s. 6d., net, cloth.) The book comprises a summary of the results of the investigations of the Liquor Effluents and Ammonia Committee, and its predecessors, together with a comprehensive survey of knowledge regarding the problems connected with the recovery and utilisation of gasworks ammonia and the disposal of effluents therefrom. A second printing has become necessary owing to the continued demand for the book. The opportunity has been taken to add a supplementary list of literature references, prepared by Dr. W. H. Blackburn, and to make a few minor corrections and typographical changes. In all other respects, the new impression is the same as the original.

The Building Exhibition at Olympia

IT might be thought that recent statements concerning the restricted housing programme would throw a wet blanket over such a function as the Building Exhibition. Financially, this latest set-back to our housing recovery must have had severe repercussions on the manufacturers of building materials and on all whose fortunes lie in providing the amenities of life. But there was little sign of despondency at Olympia on November 17, and despite the severe frustrations which beset the building industry, this 23rd biennial exhibition, the second since the war, is larger and more comprehensive than ever. The 415 firms exhibiting (80 more than in 1947), with the addition of certain other features, account for 275,000 sq. ft. The exhibition remains open until December 1.

The Minister of Health, Mr. Aneurin Bevan, opening the exhibition, spoke of the efflorescence of building techniques which had appeared during the past four and a half years, and the sometimes bitter competition between the traditionalists and the innovators. 'But,' he said, 'many systems of construction which have been nursed into being by generous Government help have proved to be short lived, and now most of our weight rests on the traditional builder and traditional materials.' In this sense the exhibition is something of a triumph for traditionalism, there being little trace of prefabrication other than complete windows, unit kitchens, &c. Referring to present housing difficulties, Mr. Bevan remarked: 'It would be easy to succumb to the importunities of those who want us to reduce housing standards in order to get quantity in place of quality. I have resisted those importunities and propose to do so. . . .' He spoke of the buildings being constructed at the moment as 'part of the social furniture of our society,' and said that in order to maintain the quality the inequality and variation in efficiency of the building industry would have to be overcome. '. . . . We have succeeded in making immense improvements in building techniques. I am bound to express some disappointment that these improvements have not been assimilated by the industry as a whole as quickly or as universally as we would have liked.'

A photograph showing the Gas Council exhibit and part of the impressive replica of the gas fire flue construction for a multi-storey building which dominated the hall.

Export Interest

More than ever before this year's Building Exhibition has strong export interest. The building industry is one of the few which depend to a large extent on home produced goods and, with the exception of steel and timber, it is virtually independent of imported materials. Much of the exhibition is aimed at keeping the use of these two imported materials to a minimum. The attraction of foreign buyers must surely have been a motive foremost in the minds of the manufacturers of industrial machinery, which occupies a considerable percentage of the total exhibits.

As in previous years, the exhibition is supported by several Government Departments. For example, the **Ministry of Town and Country Planning** (*Stand No. 451*) shows by means of photographs, charts and models how the builder benefits by planning both as a private individual and as a master-craftsman. Factors affecting decision as to the necessity for building are analysed and it is explained that the ultimate location of anything from a new house to a new town is influenced by population factors, the need for attracting new industry, the existence of good services and adequate transport arrangements. The **Ministry of Labour and National Service** Factory Department shows (on *Stand No. 456*) means of ensuring safety and making provision for welfare on building sites. Models and illustrations indicate methods adopted by various contractors to satisfy the requirements of the Building (Safety, Health, and Welfare) Regulations, which came into force on October 1, 1948. The stand is an interesting one, dealing with scaffolding, lifting gear, excavation work, site welfare, and similar operations familiar to the gas industry, and is manned by H.M. Inspectors of Factories. The necessity for housing committees, architects, and builders to decide upon appliances *before* construction is stressed by the **Ministry of Fuel and Power** exhibit (*Stand No. 457*). The importance of proper consideration of constructional requirements of particular appliances by builders is a laudable motive, and it is pleasing to see the insistence on their proper installation. The **Ministry of Health** exhibit (*Stand No. 458*), which received close attention from Mr. Bevan during his tour of the exhibition, deals with recommended designs for large and small families in town and country, and includes specially designed dwellings for old couples and single persons. A model of part of a satellite town reveals how density, open spaces, economy of road lay-out, &c., are considered, while a second model shows how a varied and economical lay-out is possible in a high density area (100 habitable rooms per acre). The use of pre-stressed concrete, the economical use of steel are important features of the **Ministry of Works** exhibit (*Stand No. 445, 447, 449, and 452*). Various recording systems for the costing, programming, and processing of building work are also shown. These Government exhibits, including that of the **Department of Scientific and Industrial Research** described below, are all at one end of the Grand Hall gallery.

The **D.S.I.R.** exhibit (*Stand No. 453, 455*), embracing all of the Department's research stations, has an admirable variety of interest. For the gas industry and those concerned with heating, the most important section is that devoted to house insulation. It is pointed out that up to 40% of the heat put into the average British house escapes through the walls, floors and roofs. Cavity walls with the outer leaf of brick and the inner leaf of foamed slag, clinker, &c., provide good thermal insulation in traditional construction. This method of construction and the use of an insulation blanket of glass silk between ceiling and joists are two of the methods of insulation demonstrated.

Gas Council

No one can deny that the **Gas Council** aimed high with their exhibit (*Stand No. P. 267*). In fact, it must be one of the highest stands in the whole exhibition owing to the inclusion as its focal point of a full-size replica of the gas-fire flue construction for a multi-storey building, illustrating the method of installing precast flue blocks. The idea is a good one, but it might have been more effective if real fires had been used instead of plaster replicas which hardly do justice to the fine appearance of today's appliances. The stand is of horse-shoe design (roughly) with white lettering on a terra-cotta facade and embraces a comprehensive selection of appliances. 'New standards of comfort' are described on one of two illustrative panels, the other illustrating 'ventilation.' The latter deals with methods of flueing, designs of terminals, and airbricks. Excellent models of large-scale gas installations such as the Goldington Street and Har-

court Avenue schemes, are also featured. Cookers, washing machines, boilers and drying cabinets, water heaters, radiators and incinerators are included in the display, together with strong 'coke interest' in the shape of the 'Vector' and 'Fulham' grates.

The **Coal Utilisation Joint Council** (*Stand No. N.239, 240*) is well worth a visit, for not only does it show the vast improvement in solid fuel publicity, but also the marked advance in appliance design. Continuous-burning convector open fires with back boiler, an inset open-close stove, combination grates, a free-standing open-class stove, insulated free-standing continuous burning cookers and water heaters, and independent domestic hot water boilers—these are the main exhibits which, it must be admitted, are likely to impress the architect and builder.

Both copper and lead services are admirably represented. The **Copper Development Association,** with a stand well up to their usual high standard (*Stand No. Q.272*), stress the increased use of copper for underground gas and water service pipes, owing to the excellent corrosion resistance of this metal. Samples of tubing which have been buried in various soils are shown, but perhaps the main interest is the fine model house designed by the Association's consulting architect, Mr. A. L. McMullen, M.A.(CANTAB), F.R.I.B.A., who also designed the stand.

Travelling Exhibit

The **Lead Industries Development Council** feature (on *Stand No. J.178*) frequent demonstrations of the soldered spigot jointing method and the use of leadburning in building work. A new travelling exhibit, comprising scale models, quarter full size, of the main uses of lead sheet and pipe, is designed for the use of technical schools. A wealth of information sheets and bulletins is available.

Another stand of interest is the small enquiry bureau of the **Fire Protection Association** which has done valuable work in reducing fire wastage.

The following list of trade stands is given as a guide to visiting members of the gas industry.

Stand No. O.253.—An excellent range of hoists and winches is displayed by **A.C.E. Machinery, Ltd.,** on their smart cream, orange and black stand. The main feature is a working installation of a workmen's/goods hoist, but a standard 15 cwt. tower mast hoist equipped with a concrete elevating skip is also operating.

Stand No. N.244.—On an interesting stand designed by Rodney Thomas, A.R.I.B.A., **Ascot Gas Water Heaters, Ltd.,** have divided their exhibits into three sections. The first deals with the complete range of instantaneous water heaters, all in operation (some on Calor gas), and includes a moving display illustrating the building up of the components into the four main assemblies forming the boiling water heater; the balanced flue heater is also featured. The centre section is devoted to office accommodation, and the third to an attractive display of FA-Neat portable appliances.

Stand N.247A.—**Bratt, Colbran, Ltd.,** have, in addition to other exhibits, a good selection of gas fires on their very pleasant and intimate stand. The fires are all working, and include the Penrith, Rayello H, Lutello, &c. The gas-fired sanitary incinerator and overhead radiant heaters are also shown, together with industrial radiant panel heaters.

Stand O.259.—In addition to factory-produced, mild steel building structures, **J. Brockhouse & Co., Ltd.,** display their well-known range of heating equipment. The gas-fired boiler for steam raising is actually working, and another appliance heavily featured is the Selfstroke automatic gravity-feed boiler.

Stand C.60.—A cream stand with lively orange and black lettering denotes the stand of the **Chaseside Engineering Co., Ltd.,** which is dominated by a mechanical shovel finished in bright orange. It is of interest to note the bulldozer blade capable of light levelling work which can be fitted.

Kitchen Equipment

Gallery Stand No. 440.—A neat exhibit by **Colour Sprays, Ltd.,** demonstrates the wide range of spraying equipment manufactured by this firm. In addition to spray guns for a variety of purposes, the stand features portable air compressor plants, driven by electricity or petrol, suitable for one to three operators.

Stand No. B.29.—Three modern kitchens, ranging from the most inexpensive arrangement to the well-known English Rose equipment, are contained on the stand of **C.S.A. Industries, Ltd.** The latter range of units enables storage, sink facilities, working area, refrigeration, hot water for sink, cooking &c., to be carried out compactly and in uniform style.

Stand H.172.—A particularly wide range of colours is one of the principal features of the rubber flooring shown by the **Dunlop Rubber Co., Ltd.**

Stand No. C.45.—One of the finest stands in the show is that of **Durasteel Roofs, Ltd.** The stand is constructed of the firm's own products—a canopy of steel and asbestos roofing sheets, walls of fine protection panelling, &c. Photographic displays and Durasteel doors are included in an ingenious whole, a brilliant piece of design.

Stand A.9.—A 'made-to-measure' kitchen is a feature of the **Easiwork, Ltd.,** stand. This firm is noted for its Architectural Service Department which specialises in designing kitchens to suit available space. The Easiwork health cooker is also shown; this pressure cooker can be used on any sort of heat with a great saving of time.

Stand L.221.—Thermal insulating materials supplied for the structural insulation of houses and factories are, of course, the speciality of **Fibreglass, Ltd.,** the materials being bitumen-bonded and made up in rolls and in a form of quilt for use in walls, &c.

Stand G.135.—The range of perforated metals and other metal products exhibited by **G. A. Harvey & Co. (London), Ltd.,** is a very wide one, and prohibits adequate description here. Steel equipment for offices and factories, gilled tubes for use as radiators, wire work, galvanised products, and glazed partitioning, are but a few of the materials to be seen.

Gallery stand 493.—Tube bending machinery is necessary for a variety of industries, and **Hilmor, Ltd.,** display a comprehensive range which includes bench fixture and light-weight portable models. Several new models introduced for the first time at this exhibition lend additional interest.

Stand Q.274.—**Ideal Boilers & Radiators, Ltd.,** have an attractive exhibit, well laid-out and surmounted by a fluted aluminium canopy. Appliances include domestic fuel-burning boilers (notably the Neofire), and the latest types of gas boilers. The most striking thing about the exhibit is the quality and variety of finishes.

Stand No. D.70.—Unquestionably the most striking stand in the exhibition is that of the **Lafarge Aluminous Cement Co., Ltd.,** which ably demonstrates the remarkable strength of Ciment Fondu concrete. The office accommodation of the stand is raised to a considerable height on one vertical support and will, we were told, safely support 30 men.

Stand No. R.287.—The well-known mobile cranes manufactured by **R. H. Neal & Co., Ltd.,** are seen to advantage on their stand. The examples shown are the new Type GM 15-cwt. capacity, which can be fitted with a self-erecting telescopic mast for high lifts up to 40 ft., and the latest model of Type QM 6-ton with a 35 ft. swan-neck jib, fitted with grab.

Stand No. L.219.—The full range of fixing devices and tools manufactured by the **Rawlplug Co., Ltd.,** is now so large that it is almost impossible to pick out particular examples. However, mention might be made of the durium-tipped masonry drills which can be used in a joiner's brace, and Rawlclips, easy-to-fix clips for steel girders.

Gallery Stand No. 409.—**Roneo, Ltd.,** products are familiar to most, but attention must be drawn to the two duplicators featured on this stand—the Series II '500' and the '150.'

Steel and Brass Tubes

Stand No. E.107.—**Stewarts and Lloyds, Ltd.,** have an island stand containing a tubular framed building at one end of which is a small reception office, and, in the centre, a revolving table carrying examples of brass foundry products by John Russell & Co., Ltd. Surrounding this centrepiece are screwed and socketed steel tubes, a selection of joints, and a new type of standardised hand railing.

Stand No. K.202.—The well-known range of Flexo products is featured on the stand of **Thomas & Bishop, Ltd.** These include furnace cements, cored solders, jointing paste tinning compound, &c., and also Permac, the metal-to-metal jointing.

Stand No. D.62.—**Warsop's Power Tools, Ltd.,** on an excellent stand, exhibit a large range of tools, in particular the S.6 breaker, which is entirely portable and self-contained, as is the D.P. rock drill, also shown.

Stand No. G.132.—Copper tubes in astonishing variety attract the eye to the attractive exhibit of the **Yorkshire Copper Works, Ltd.** Of considerable interest is the range of Yorkshire fittings, and those in the 3-in. and 4-in. sizes are shown with tools for assembling the fittings on site.

Progress in the South West

Chairman Reports to Consultative Council

AT the second meeting of the South Western Gas Consultative Council, held at Taunton on November 16, it was decided to discuss gas prices in private and to issue a statement to the Press later. When one member said he had no objection to the reporters remaining for the discussion, the Chairman (Mr A. W. Loveys) commented: 'We have to be rather careful at this juncture and I would ask you to exercise a little caution.' Answering a question about the effect of the withdrawal of the new scale of charges in the south-west, the Chairman said those who had paid any increases would get their money back. Those who had had a reduction would not have to pay the higher price. In other words, those whose charge went down from 2s. 7d. to 2s. 4d. a therm would not have to pay the extra 3d. on every therm used since publication of the notice. The Chairman then gave a report on the recent work of the South Western Gas Board.

One of the advantages that had ensued from the grouping of gas undertakings, he said, was the possibility of bulk buying with its consequent economies. In this the smallest undertaking shared the advantages and even increased those previously obtained only by the largest undertakings. Already, in this way, economies totalling nearly £100,000 in a full year had been effected by the board and the benefit would react to the consumer in the year 1950/51. This was a material credit against the £600,000 estimated loss taken over from the working results on vesting day.

Major Repair Problems

Plant repairs and replacements had furnished the board with major problems for, as in other industries, the supply position was seriously affected for about 10 years by the war and its aftermath. Materials and labour had been scarce and thus undertakings were compelled to defer plant repairs and replacements. The fact that the board took over at vesting day from the various undertakings within the area capital commitments for replacements costing £5 mill. was an indication of the amount of replacement requiring to be done. The foresight of those undertakings in placing orders was appreciated by the board for the delay in obtaining materials with which to make replacements might otherwise have been very serious. Since then, additional expenditure of £1,250,000 had been authorised with the object of furnishing a better service and further schemes. In respect of Bristol and Bath alone, the board had in hand schemes for the provision of new manufacturing plants and improved service to the consumer which would cost over £2 mill.

The board had been able to fix standard prices, with common hire purchase terms, for all gas equipment in the area. This made even more important the board's acquisition of a mobile showroom which would allow the inspection of modern gas appliances of many types by consumers in rural areas and small towns, or where there was not easy access to a commodious showroom. It was part of the board's policy of service to the consumer to extend the provision of showrooms so that their goods might be displayed to the public and that facilities for service throughout the 24 hours should be available in most localities. The mobile showroom would start its tour from Bristol, working its way through the Northern Division and then the Southern Division. Its progress and results would be followed by the board with keen interest, for its acquisition was one of the first steps taken by the board towards a better service to the consumer.

The coke user would also benefit from the amalgamation of the various undertakings for there was now generally available graded coke properly sized and of the right quality, to encourage its more widespread use.

From January 1 next, many gas consumers, particularly those previously served by the smaller undertakings in Devon and Cornwall, would be provided with gas of a constant and declared calorific value. Among matters to which the board was giving consideration was the standardisation of meter rents throughout the area. These at present varied widely. The board was also investigating a promotional tariff, the principles of which, when finally agreed, would be standard throughout the area. They would be concessionary to gas users and thus would promote sales. As soon as the board was able to see the practicability of a scheme, no time would be lost in communicating with the council so that the benefits might be passed to the consumer.

Throughout the area, work on mains replacement or substitution was going on steadily and there were already many improvements in supply and pressure.

Deferred Price Increases

The question of the withdrawal of notices of increased gas prices was considered in committee and a statement was afterwards issued recording that the consultative council in its discussions of the situation was mindful of its agreed view that it was essential for the income of the South Western Gas Board to be augmented if it was to pay its way. This must mean increases in gas prices but the board's proposals regarding these had not yet been submitted to the council. When they were a special meeting would be held to consider them. In the light of these considerations, the council passed the following resolution: 'That this council takes note of the withdrawal of the notices relating to increases in the price of gas as from July 1, 1949, and, having regard to the issues, which included complex legal ones, which would have faced the South Western Gas Board if it had proceeded with the published notices of increase of price, is satisfied that gas consumers' interests will be best served by that withdrawal of those notices and the proposed issue of fresh ones.'

North Western Consultative Council

At a meeting on November 17, the North Western Gas Consultative Council considered the claim of the Birkenhead Corporation with respect to a price reduction fund, for which the Corporation has enabling powers under a local Act, and which, in its opinion, should have been offset against the recent proposed increase in the price of gas for the Birkenhead area.

The consultative council referred the issue back to the area board, and recommended that it was desirable to obtain the opinion of counsel, that there should be a further examination of the financial position of Birkenhead, and that the proposed increase be withheld.

The council is setting up district committees, of which there will be four, comprising North, South, East, and Western districts.

A Visit to Stoves, Ltd.

Under the leadership of the President, Mr. R. J. Bradshaw, members of the Manchester District Junior Association of Gas Engineers visited on November 2 the works of Stoves, Ltd., Rainhill, where they were welcomed on behalf of the firm by Mr. J. L. P. Mercer, one of the Directors. A tour through various departments followed, during which the process of manufacture of 'Newhome' gas cookers and other gas appliances was seen. The laboratory with its modern equipment created considerable interest and the staff of chemists explained the various apparatus used in testing the materials, and subjecting new cookers, &c., to efficiency and cooking tests before being put into production. Research is a major part of the laboratory programme. Great interest was also shown in the different processes carried out in the enamelling department.

After tea in the works canteen, Mr. **Bradshaw** thanked the Directors and staff of the firm for making the visit so pleasant and for their hospitality. A vote of thanks was proposed by Mr. **L. G. Townend** (Liverpool), and supported by Mr. **G. P. Humphreys** (Blackburn), Mr. **R. Knight,** Director, replying for the Company. Mr. **P. Jackson,** Mr. **W. Richardson,** and Mr. **J. L. P. Mercer,** Directors, joined in welcoming the members.

To Increase production knowledge the British Welding Research Association has established a team of development and liaison engineers, who will interpret the research results of the Association, and will visit and discuss any particular problem connected with the applications of welding. The team will have at their disposal the scientific and technical resources of the Association, including the joint B.W.R.A. and Institute of Welding Library.

Industrial Gas in Manchester

A *Gas Journal* Abstract of a paper by W. F. Howell, of the Manchester Industrial Gas Centre, North Western Gas Board, at a joint meeting of the North Western Section of the Institute of Fuel and the Manchester Branch of the Smoke Abatement Society

UNLIKE Sheffield with its steel industry and Stoke with its pottery, Manchester is the home of many different trades. For though Manchester is the centre of the cotton industry there are comparatively few cotton mills in the area served by its gas undertaking. This area includes Openshaw and Gorton, where a number of large engineering firms are situated, but it excludes Trafford Park which is served by the Stretford undertaking. On the other hand it includes the new Wythenshawe Estate for light industries where one of the conditions attached to the erection of a factory is that it shall be smokeless and where, as a consequence, gas is the most popular fuel. The main industries, therefore, in the Manchester gas area are engineering with machine tools, textile machinery, locomotives, steel wire, electrical equipment, gasworks plant, and foundries. Other trades and manufactures include chemicals, clothing, some textiles, bread and biscuit baking, brewing, rubber, brake linings, printing, tobacco, and packing material. Gas plays an important part in all these activities. In the peak year, 1943, with its vast output of munitions of war, 4,707 mill. cu.ft. of gas, or 58.8% of the total gas sold, was used in industry. This figure fell sharply in 1946. Last year it was 3,970 mill. (41.9% of the total) and is rising rapidly, checked only by the availability of gas-making plant.

Gas is used in many of the operations in the manufacture of steel castings and forgings by the English Steel Corporation, Ltd., Openshaw. Ladles are lined with refractory material which needs to be dried and heated up to a temperature of 500°C., or reheated to the same temperature, before the ladle receives its load. When this is 30 tons or over a large burner unit, designed and constructed by the Manchester

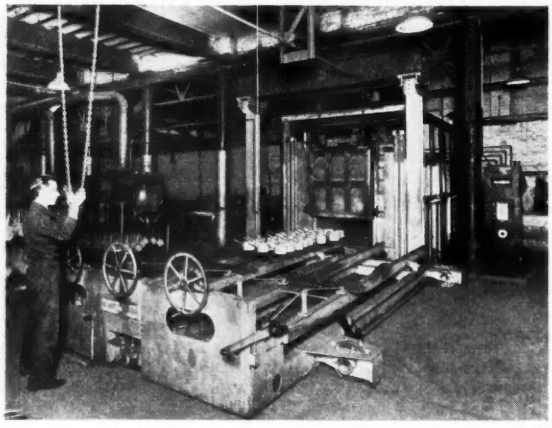


Fig. 1.—Muffle furnace for firing vitreous enamelled articles.

Industrial Gas Centre, is lowered into the ladle by a suitable crane. A 40 ton ladle will contain 10 tons of lining which requires 36 hours to dry and heat when new and 6 hours to re-heat for subsequent melts. The maximum gas rate of the burner is 10 therms per hour. Ingot heat treatment is carried out in a battery of furnaces 72 ft. long in which temperatures are automatically controlled between 250° and 780°C. over a time cycle of 40 to 60 hours. Material for drop stampings, crankshafts, stub axles, &c., is heated in a regenerative furnace with automatic change-over gear and automatic temperature control operating on gas, air, and flue damper. In a long line of regenerative furnaces used for hardening, tempering, and stabilising steel forgings, each furnace has a capacity up to two tons over a heating period of four to seven hours, hardening at 850°-900° C., tempering and stabilising at 500 and 650° C., with a maximum gas rate of 3,000 cu.ft. per hour, all automatically controlled.

In the iron foundries gas is increasingly used for core and mould drying and the gas torch is used for lighting cupolas. The large foundry of Mathew Swain specialises in domestic fire ranges, kitchen pans, and kettles; it uses gas in the vitreous enamelling shop and in many other processes. Fig. 1 shows

Fig. 2.—Outlet end of continuous normalising furnace treating 25 cwt. of wire rod per hour.

a muffle furnace for firing enamelled articles at 760°C. on cast iron and 850°C. on pressed steel at a maximum gas rate of 2,280 cu.ft. per hour with a throughput of about 9 cwt. of cast-iron articles per hour or 10 loads each of 50 pieces in pressed steel per hour.

Increasing quantities of town gas are being used in the extensive wire works of Richard Johnson & Nephew. A recent aerial photograph of their Manchester works exhibited on the screen showed in a convincing way the consequent almost complete absence of smoke in this district. Fig. 2 shows the outlet end of a gas-fired continuous normalising furnace treating 1¼ tons of wire rod per hour. Thirty-two 'ends' of 5 s.w.g. wire are passed simultaneously through three zones, preheat, first, and second controls at 950°C. With gas firing it is simple to maintain the slightly reducing atmosphere necessary to prevent excessive scale formation. Acid tanks for cleaning the wire are generally heated by steam, but Mr. Howell mentioned an installation in an adjacent town where gas burners are submerged in the bath in perforated tubes, the products of combustion bubbling up through the bath, thus not only securing a very high thermal efficiency but keeping the bath in a state of violent agitation giving such effective pickling that it is possible to run at a lower temperature with a consequent further reduction in heat consumption. Gas also finds its uses in drying and galvanising the wire.

In the vehicle industry, covering locomotives and aircraft as well as motor vehicles, and in the manufacture of such accessories as springs, brake linings, and accumulators, considerable quantities of town gas are used. Synthetic paints of the thermo-setting type are replacing cellulose for many purposes and for storing these there have been many installations during recent years of gas infra-red tunnels. For the heat treatment of tools in the machine tool industry the gas-fired furnace with its precision temperature adjustment

and control, and particularly in its control of atmosphere, is becoming indispensable.

In the textile industry gas is used for singing-off all loose fibres from yarn or fabric. The process is known as 'gassing.' A 'gassing' frame may have as many as 100 separate burners, while a 'gassing' shed may contain up to 12 frames or more. In view of the necessity for keeping constant flame conditions over so large a number of burners it is almost universal practice to use a gas-air premixer which governs and mixes air and gas at a pre-determined ratio, compresses the mixture, and delivers it to the burners at constant pressure adjusted to suit the varying counts of the yarn. A comparatively recent development in the textile (particularly rayon) industry is treatment to give crease resistant properties to the material.

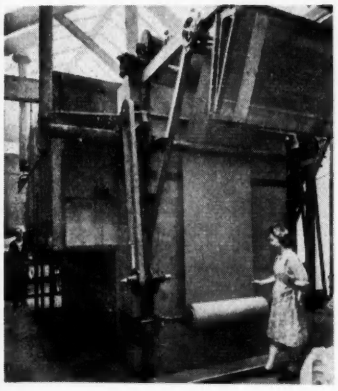


Fig. 3.—Gas-fired oven for baking cloth to impart crease-resistant finish.

The cloth is passed through a solution of thermo-setting resin and then dried, after which it is baked at a higher temperature to polymerise the resin. The time and temperature vary slightly but usually the cloth is baked for about four minutes at 300° F. Fig. 3 shows a gas-fired oven for this process. It consists of a chamber through which the cloth passes on a festoon conveyor. Hot air is blown in at each side from two independent gas-fired indirect air heaters.

The Manchester Centre is handling a number of enquiries for the application of gas to drying cloth during finishing. Particularly it is working with the British Cotton Research Association on the application of the gas-fired radiant heat panel. A trial plant gave very high rates of drying on a stenter. In the clothing trade, for which Manchester is an important centre, gas finds its application in the use of many comparatively small gas-fire boilers. The final stage in the manufacture of all clothing is pressing, and this, both by

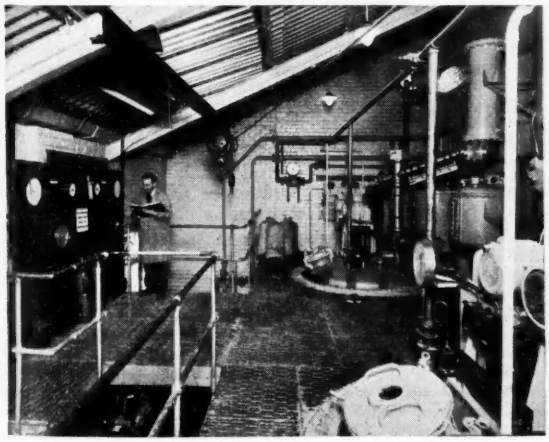


Fig. 4.—Control panel and top section of two to two-and-a-half ton varnish kettles.

makers and dry cleaners, is carried out on steam-heated presses. The advantages of gas over other fuels are obvious; no space is required for fuel storage (an important point in confined premises off the ground floor) and the absence of any risk of the clothing becoming soiled from contact with solid fuel.

In paint and varnish manufacture the main uses of gas are for oil boiling, gum 'running' in the making of oil varnish, and for the preparation of media for synthetic paints. In these processes the main requirements are a high rate of heat input in the initial stages and complete control in the final stages when the reaction may become exothermic and the oil overheat, boil over, or set on fire. Such control is only roughly possible with solid fuel. Fig. 4 shows the control panel and top portions of a number of 2 to 2½ ton varnish kettles. In practice all the burners (three to each pot) are lit. If the varnish was to be heated to, say, 520° F., one controller would be set to this temperature and a second controller would be set to, say, 480°F., while a time switch would be set to the time it was desired to maintain the varnish at 520°F. When 480°F. was reached the air and gas supply to the two main burners would be switched off and the temperature brought up gradually to 520°F. by the pilot burners only. It would then be automatically maintained at 520°F. for the desired period when the pilots would be shut off and air blast started to cool the setting.

The baking and confectionery business in Manchester is not greatly different from that in any other city of comparable size. The advantages of gas fuel in this direction are well-known and fully recognised by the industry. Among recent installations is an imposing battery of 5-tier confectionery ovens, the first of their type. They are heated by batteries of tubes running horizontally the full length of the

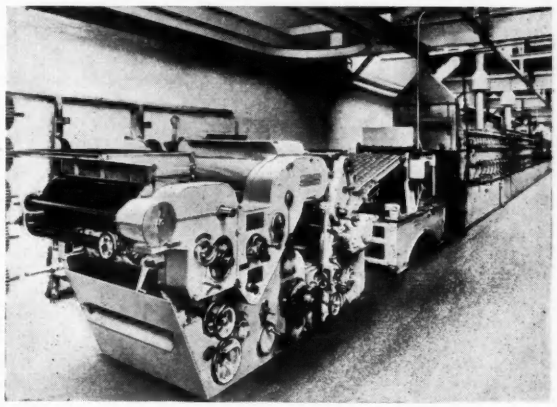


Fig. 5.—Continuous biscuit oven.

ovens over and below each deck. The tubes of solid drawn steel are completely sealed. They project out of the oven into a combustion chamber where gas is burned. Each tube contains a small quantity of water which boils and expands until the required temperature is reached (for bread 450°-500°F.). This method of heating results in very even temperatures throughout the whole of the oven. Another installation is a swinging tray conveyor continuous oven baking biscuits heated by gas burners operating at 3 lb./sq. in. gas pressure. This is illustrated in Fig. 5.

Finally, there are many installations of steam raising plant. An important point made by Mr. Howell is that the gas-fired boiler is practically as highly efficient in the smaller as in the larger units. Consequently, in the smaller sizes they are often more economical than those fired with other fuels. In the space heating of a number of scattered blocks of buildings, as for instance at the Ringway Airport, it was found most economical to install no fewer than 12 gas boilers in the separate blocks Space heating, washing facilities, and canteen kitchens are features of every modern factory. A typical canteen kitchen at a large chemical works in the area serves over 500 main meals daily at an average cost, including beverage, of from 0.1d. to 0.3d. per full main meal.

[*Mr. Howell was addressing a joint meeting (on November 9) of the Smoke Abatement Society and the N.W. Section of the Institute of Fuel. One felt that he convinced his audience not only that the American phrase 'The Trend is to Gas' applied to Manchester industry, but that the gas undertaking was helping to increase production, improve the conditions for workers, and, what most appealed to this particular audience, reduce the pollution of Manchester's atmosphere.*]

'HELPING THE STUDENT'

By R. F. BELL, B.Sc.

***EDITOR'S NOTE*:—Pointing to the fact that for a number of years the gas industry in Scotland has had great difficulty in recruiting young men willing to pay the premium of five years' hard labour for the assurance of a reasonably stable future, the author sets out suggestions on how the position could be improved. He pins his faith largely to the principle of group working for the establishment of better educational facilities within the gas industry**

IN the course of his presidential address to the Scottish Junior Gas Association (Western District), in Glasgow, Mr. **R. F. Bell,** B.SC. (Tradeston Gasworks, Glasgow), remarked that in the past it had too often been the case that a boy with an interest perhaps in chemistry or with an aptitude in handling tools left school and became the new boy in a gasworks laboratory or fitting shop. He was told, or even allowed to discover, that it was desirable to take classes, but in many cases the classes were a ladder to a certificate only, and not to a better appreciation of his work. There were unfortunate conditions: (1) The difficulty of attracting a sufficiency of new men who would train for professional positions; (2) the long drawn out period of study, now being added to and being made less easy to complete; (3) the lack of facilities and encouragement to align studies in college with practical work done during the day in the works.

'I believe,' said Mr. Bell, 'that it should be possible to remove all these together, without in any way lowering the standard of the final product, the qualified gas engineer.' As a first requirement all normal recruits to the technical staff in the industry should have obtained a Higher Leaving Certificate which would give exemption from the common preliminary examination of the new Education Regulations of the Institution of Gas Engineers. This would serve two purposes. No students would start on the course who did not have a reasonable chance of obtaining a pass, and no young student would be faced with the necessity for one or two years at night classes before beginning his professional studies proper. As a second condition for facilitating study part-time day classes must be accepted as usual rather than exceptional. In several of the country's major industries this was already recognised and co-operation between employers and colleges had produced an arrangement, now in its third session in Scotland, by which more students were being enrolled each year and trained under conditions much less arduous to themselves, which left time for the reading and revision at home which had been so often left undone in the past. The first three years of the new course of study for the examination for Associate Memberships of the Institution were identical with those for the Ordinary National Certificate in Engineering, and in many centres the part-time day classes were already available. There would seem to be nothing to stop the immediate participation in these of gas engineering students.

Group Working

Mr. Bell's third requirement for the easing of the lot of the student would have for its purpose the bridging of the present canyon between work and classes. How often, he asked, did the young gas engineer have to sketch and describe a setting of horizontal retorts, complete with tar tower, when he had never even seen one? Or the keen young jack-of-all-trades from the 30 mill. works at Inversnecky have to explain the manipulation of an apparatus for the complete analysis of town gas? Surely it was possible to ease the path of the student here, to give him the opportunity to see and work with the various items of plant with which he was expected to be familiar, to know what a laboratory looked like from the inside, and to have more than a nodding and infrequent acquaintance with set-square and compasses.

The author continued: Works should be arranged in groups so that each one in a group is within reasonable travelling time of each other, very much as has been done by the gas board in the sub-division of the area. Each of these groups would form a base for the works training of its own students. As is done at present in some undertakings, a form of apprenticeship should be arranged, giving each trainee an opportunity of working for a period in the various sections of the industry. The fitting and maintenance shop, the drawing office, the retort house and purifying plant and the laboratory, would each have its own time, but since more than one works would be available for the distribution of the comparatively small number of students necessary no works would feel that it carried a passenger.

Liaison Between Class and Work

'I envisage a training scheme controlled by the area board through an officer whose duty it would be to see that there was effective liaison and correlation between a trainee's work in his classes and his employment during the day. No young man would be expected to train outside this scheme, and works situated remote from an educational centre, like Oban or Stranraer, simply would not recruit youths intending to train and educate themselves as gas engineers. During the first three years of study each young man would be systematically transferred from one training section to another, not necessarily, or even desirably, in one works. While in one section he would naturally be under the control of the appropriate works chemist or works superintendent, but the education officer would have the duty of seeing that he profited by his experience.

'Part-time day classes do not continue throughout the year, and in the vacation period the day normally spent in college could be most profitably devoted to what I might term a "tutorial"; an inspection of a works, or a special section in a works, or even a single item of plant under the supervision of a qualified instructor in the unit being examined.'

Specialisation

With the increase in specialisation which was inevitable in the gas industry it would be impossible to evolve a training scheme which would be of service to all students throughout their whole training period. But by the time a young man had reached his fourth or fifth year of study his aptitudes or preferences would have shown themselves and he would then be employed in the duties most suitable to both himself and his employers.

'Naturally,' continued Mr. Bell, 'a training scheme such as I have outlined would cost money. It might increase the industry's requirements in junior technical staff (because that is what our students are) by 10% or 15%. An education and training officer would be required, and the part-time services of qualified men would be involved. But I maintain that any expenditure would pay dividends. The primary object of the scheme would be to produce better trained men than we have at present, and if in this it proved successful then in a few years the results would be shown in works better operated and better maintained.'

He had spoken throughout of training for works operation, and had not referred to the distribution and utilisation engineer. This was purely because he was a works man, and was

(*Continued at foot of p. 475*)

TOP IRONWORK OF CONTINUOUS VERTICALS*

By K. SULLIVAN,
Liverpool Undertaking, North Western Gas Board

IN 1948 the four beds of 85 in. West's continuous vertical retorts at the Linacre works of the Liverpool undertaking were extensively repaired, and the opportunity was taken of installing a new design of top ironwork.

Originally, there was one 10 in. diameter offtake pipe per retort, and this was arranged at the end of the top casting nearest the foul main. The offtake pipe was fitted with a ball type valve and cleaning door. The four offtakes for one bed delivered into an overhead central collecting main of mild steel construction with a 'V' shaped bottom plate. This collecting main was drained direct to the tar well once per week, and recharged with thin tar up to the level of the gas outlet pipe. The overflow from the collecting main was led direct to an underground separator at the tar well. There were no liquor sprays in the collecting main, and the tar supply was from a small-capacity overhead tank fed intermittently. A vertical gas connection fitted with a stop valve led the gas from the side of the collecting main to the foul gas main.

It had always been noted on this installation that excessive pressure conditions existed at the poking hole furthest from the 10 in. offtake. This was, to some extent, overcome by the operators clearing the coal under the division plate by poking through the rodding holes, but naturally this meant a considerable amount of work on their part.

In view of the results that had been achieved, both by the contractors and with our own design of short-sprayed offtakes, it was decided that the ironwork should be re-arranged so that liquor sprays could be incorporated. The main aim was to have as short an offtake as possible before the spray, as the amount of blockage after such a spray is generally very small provided that the spray is adequate and the liquor satisfactory.

A cup valve which would provide a liquor seal was adopted, similar to that already proved by extensive use throughout the country. In consequence of our adoption of a liquor sealed valve it was obvious that the new offtake would have to be an arch pipe. The pipes were to discharge into a hydraulic collecting box and, in order to obtain a compact arrangement, it was realised that the offtakes would have to deliver into a box situated centrally between the four retorts.

To relieve the pressure troubles, the top castings were modified as follows: A hole was burned in the division plate and a longitudinal skirt plate was included. The skirt plate deflects the coal so that a clear passage is left above the coal. The passage affords access for the gas to reach the hole in the division plate and, if needed, to force through a small amount of coal under the plate.

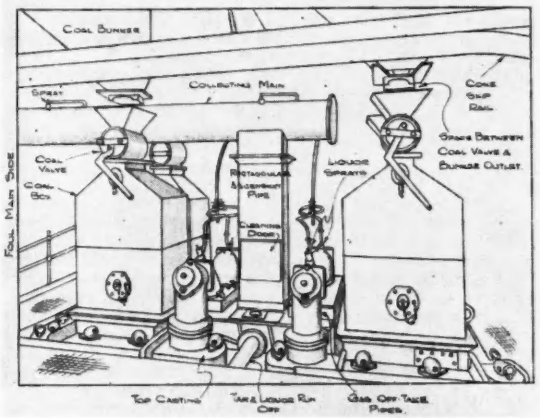
The old socket type of joint between the coal box and the top casting was not considered satisfactory, and the opportunity was taken to alter this joint when the coal boxes were renewed. In order to obtain a flanged joint at this point, a ¼ in. thick flat was welded to the coal box at the bottom, and 3 in. by 2½ in. angles were bolted to the top casting.

The lower compartment of the hydraulic collecting box was built with a central cleaning lute. The bottom plates of the box were arranged at a maximum slope towards the lute, because it was realised that this particular part was difficult to clear. Liquor sealed skirt plates were arranged to provide a gas free space for cleaning purposes.

The most desirable position for the point of overflow of the tar and liquor was considered to be in the cleaning space, thus making is possible for the overflow pipe to be swept regularly. Valve chests made from 6 in. by 3 in. channels were accommodated at each end of the hydraulic box, two cup valves being contained in each chest. The C.I. cups were mounted on M.S. spindles and were operated by weighted levers. It was necessary to design these levers so that they would maintain the cup valve full of liquor in the closed position. The method of ensuring gas tightness at the valve spindle bearings was to provide two grooves in each bearing. These grooves were packed with grease under pressure by a Tecalemit lubricator, thus serving the dual purpose of sealing and lubricating the bearing.

To ensure that the collecting box would not be disturbed by the movement of the bench when heats were raised, the box was supported from the floor steelwork which was connected to the bench bracing.

The design of the pipes had to allow for probable discrepancies in the retort centres, because the repairs at that time to the bench brickwork only allowed for the top half of the retorts being reset. Originally, it was hoped to account for the variation in retort centres by dividing the arch pipe by a central vertical joint in which packing of varying thickness could be placed. However, the actual variation was found to be 1¼ in. and a packing of this thickness was considered undesirable. It was finally decided to vary the packing up to a maximum thickness of ½ in. and to take up the remainder of the difference in retort centres at the point where the offtake pipe enters the valve chest. The flexibility at this latter point was achieved by arranging the hole in the valve chest cover which takes the spigot end of the offtake pipe to have plenty of clearance. The joint flange on the offtake was not drilled for bolts, but it was fastened to the valve chest cover by four clips.



Arrangement of top ironwork after the alteration.

The position and angle of the boss to take the liquor spray was fixed so that there would be no possibility of liquor entering the retorts. A boss was also provided for the purpose of future experiments in using a steam jet in place of a liquor spray. The cleaning door is fastened to the offtake by studs and large wing nuts and the facility of swinging the cover clear of the cleaning hole has been allowed for here. The type of socket joint between the offtake and the top casting has not been altered, although it was necessary to increase the offtake from 9 in. to the original 10 in. dia. at this point.

The central ascension pipe from the hydraulic collecting box was made rectangular in section to accommodate fair-sized cleaning openings in the top plate of the box on both sides of the ascension pipe. A seating for an explosion plug has been incorporated in the cleaning cover on the pressure side. A new 16 in. dia. M.S. pipe conveys the gas to the downcomer which delivers into the foul main.

* Abstract of a paper to the Manchester District Junior Association of Gas Engineers, November 2, 1949.

Helping the Student :—*Continued from p. 474*

in no way to be taken as inferring that he did not consider a similar scheme desirable for the man whom they saw only in the mornings and evenings.

There were at present in operation throughout the country schemes of education and training which were not designed to produce chartered gas engineers, but had as their objective the improvement of the ability of the student in his own sphere, be it gas salesmanship or gas fitting. The scope of such schemes could be widened with much advantage. In particular a short course of classes, informal and held in a works, should be arranged for plant operators, stokers, and scrubber attendants, for instance.

The unusual feature of the new type of spray is the cleaning device, which can be used without interrupting the liquor supply. The liquor flow is 1 gal. per min. and the pressure at the inlet to the spray is 10-15 lb./sq.in. Two sprays were also fitted in the overhead gas main. Branch pipes of 2 in. dia. supplied liquor to the six sprays on each bed. These branch pipes were fed by a new 3 in. dia. liquor main which was connected to an existing liquor main at the top of the bench.

The overflow pipes from the hydraulic boxes were taken underneath the platform plates to the side of the bench, where they delivered into a main which drained to a separating tank inside the retort house.

The final arrangement of the new top ironwork is shown pictorially on drawing No. 6 in the accompanying diagrammatic illustration.

New Design in Operation

The new top ironwork has fulfilled the objectives of improved cleaning facilities, working conditions, and general appearance. Equality of pressure conditions at all the rodding holes is now standard practice, and the operators have to do far less rodding than hitherto in order to achieve this.

The inert content of the gas has also been considerably reduced, but the whole of this improvement is not claimed for the new design of offtakes, as the condition of the retorts has also been improved, though the modifications to the pressure conditions must have effected a major improvement.

No blockage of the offtakes has occurred since they have been converted to the spray type.

The expected better foul main conditions, owing to the use of liquor sprays, have been obtained. This installation was put in during the period when the retorts were down for an extensive repair, but not a complete renewal of the retort sections. I feel it important that this point should be emphasised, as it means that improvements could be effected without waiting for the retorts to need complete rebuilding.

The following criticisms have been made by those engaged on the plant, and it is thought that these will be of interest :—

(a) The type of fastening for the cleaning cover was not considered suitable if this cover was to be removed frequently. This is owing to the necessity to apply a considerable amount of force to the wing nuts in order to maintain gas tightness. Perhaps a more suitable cover would be one utilising an eccentric or a wedge for tightening purposes. Arising from the unsuitable fastenings on this cover, the cleaning of the offtake pipe is now effected by entering a special auger through the sight plug hole in the centre of the cleaning cover.

(b) The general design of the spray is not considered robust enough. Apparently, it is not a difficult matter to break the spindle and bend the cleaning needle when an attempt is made to clean a particularly hard obstruction from the orifice.

(c) When the detail of the hydraulic box was considered, it was stated that the bottom plates were set to give the maximum possible slope. However, the tendency for deposits to accumulate on the bottom plates indicate that this slope is, in fact, insufficient.

ALUMINIUM STANDARD

The various British Standards for aluminium and aluminium alloy ingots and castings have now been combined into a single schedule, which has just been published as B.S. 1490: 1949, aluminium and aluminium alloy ingots and castings for general engineering purposes. The schedule also includes specifications for ingots and castings which have not previously been covered by British Standards.

A system of nomenclature, in line with that adopted in the recently issued B.S. 1470 for wrought aluminium and aluminium alloys sheet, strips, &c., has been adopted. The standard covers aluminium of 99% purity and 20 different alloys each in the form of ingots and castings. Details are also given in regard to the certification of compliance with the standard independent tests the provision of test samples and inspection procedure.

A few copies of the standard were distributed before October 3, containing a printer's error in alloy LM-6-M on page 22 where the percentage maximum limit for copper was given as 0.3% instead of 0.1%. Anyone possessing a copy with this error is asked to return it to the British Standard Institution, and a correct copy will be supplied in return.

Copies of the standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 7s. 6d., post free.

'GAS RESISTANCE PRESSURE'

We have received from the author, Dr. Max Hofsäss, of Berlin, a copy of a paper he has written on 'Gas Resistance Pressure, a Characteristic in the Evaluation of Coals During Carbonisation.'

The paper describes a new method for determining the gas pressures developed during the carbonisation of coal, which, it is suggested, is a better criterion of the swelling property of a coal than its volumetric expansion during heating. The pressure-time curves, which follow closely the gas evolution-time curves, show marked differences between different classes of coal—and hence can be regarded as typical characteristics of them.

The gas pressure measured is the difference between the pressure in the coal charge and that above it and hence depends on the volume of gas produced at any particular moment, its density and viscosity. as well as on the plastic state of the coal at that moment. The relationship is expressed by the simplified formulæ $\frac{P=E}{A}$ in which P is the gas pressure—called 'gas resistance pressure'—E the volume of the gas evolved within the coal charge, and A the volume of the gas leaving the coal charge. Thus by increasing A, P is reduced. which can be brought about by admitting an inert gas during carbonisation or by adding water to the coal prior to charging. A case is quoted in which a coal moderately swelling in the dry state becomes non-swelling when 20% of water is added. This artifice is of great practical importance and a means of rendering strongly swelling coals harmless. Although, as the author states, only few—about 3%—coals develop pressures up to one atm. (15 lb.) and are highly dangerous to retort and oven walls, the large percentage of moderately swelling coals (85%) develop pressures up to one-third atm. (5 lb.) and would produce serious stresses in oven walls if Koppers experiments on oven walls are taken as a criterion. According to Koppers, cracks begin to appear at one-tenth atm. (1·5 lb.), while oven walls begin to shear at one-seventh atm. (2 lb.), but, as the author points out, the experimental figures are not directly applicable to practical conditions.

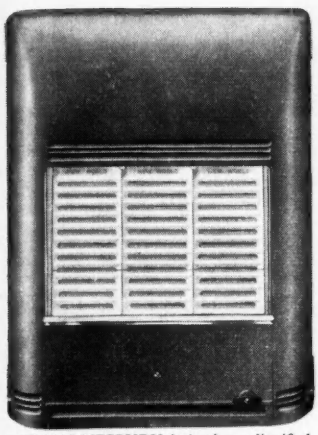
In conclusion attention is drawn to the possibility of using the apparatus described for determining the plastic stage of a coal by the method described by Foxwell (1921) or its modification developed by several German research workers.

LEAD PIPE STANDARD

B.S. 602, lead pipes for other than chemical purposes, has just been revised. The experience gained since 1939 has shown that requirements as to chemical composition cannot apply equally to all the pipes covered by the standard. The new edition therefore increases the metallic lead content and reduces the antimony and tin contents of service and distributing pipes and gas and condensation pipes. A new composition has been adopted for flushing and warning pipes and soil, waste, and soil-and-waste ventilating pipes. The requirements relating to grain size have now been made applicable only to service and distributing pipes, and illustrations have been included representing excessively fine and excessively coarse grain sizes, which can be compared with the desirable mean size. A tolerance has been specified on wall thickness and the marking requirements have been amended as compared with the earlier edition of this standard.

Copies of this standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, Prices 2s. 6d. post free.

British Railways are to equip nine locomotive tenders with coal-weighing apparatus. The apparatus consists of a separate bunker, with vertical sides and self-trimming back, which fits inside the tender and normally is locked on brackets when the locomotive is moving; when it is desired to weigh the coal the locks are released and the load is transmitted by levers to a steelyard on which it can be measured by means of the usual sliding weights. The objects of the test are to ascertain the amount of fuel consumed when using the same or different grades of coal, while performing the same class of work, over any particular section of the line with various types of locomotive.



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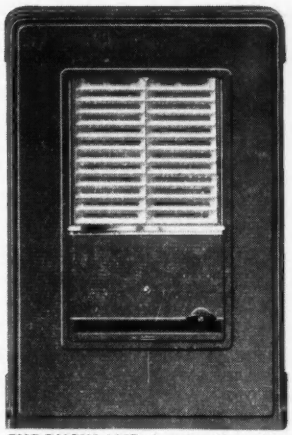

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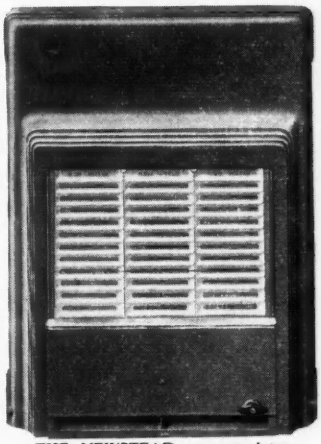

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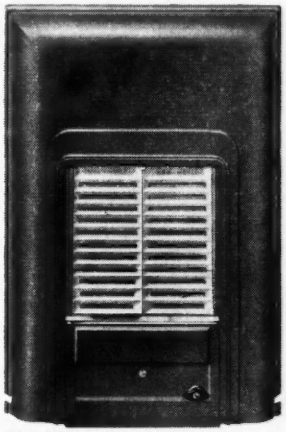

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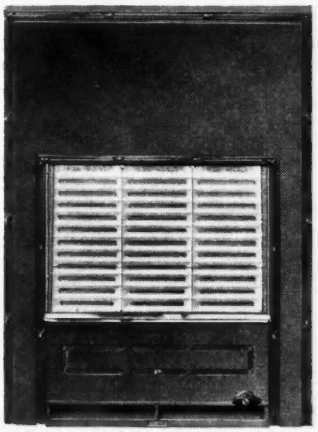

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NEW WORLD NEW WORLD NEW WORLD

THE COST OF A DOMESTIC HOT WATER SERVICE BY GAS

Following is our report of the discussion on the paper on 'The Cost of a Domestic Hot Water Service by Gas' which Mr. C. H. Purkis, North Thames Gas Board, Watson House, presented to a meeting of the London and Southern Junior Gas Association on October 21. A full summary of the paper was published in the *Journal* of November 16 (pp. 413-425).

MR. **G. H. Fuidge** (South Eastern Gas Board) complimented Mr. Purkis on his breadth of vision. It was easy, he said, for a technical man to confine his attention to the technical performance of appliances without full regard to the financial aspects. Domestic water heating was an excellent load and should be extended to level-up increases in space heating and other seasonal loads. Many factors had tended to restrict or even reduce the use of gas for water heating compared with pre-war times, the two most important being the increased capital cost of installations due to purchase tax and increased cost of labour, and the Government-sponsored use of high efficiency solid fuel appliances which supplied hot water in addition to space heating.

The smokeless fuel grate with back boiler had an overall efficiency of about 50%, of which 25% was space heating and 25% hot water. A coke fire with no back boiler and used for space heating only had an efficiency of about 32%, so that by increasing the rate of fuel consumption from 1¾ to 2 lb. per hour the same degree of space heating was obtained and in a 12-hour day some 70,000 B.Th.U. was put into hot water, and even assuming standby losses as high as 40,000 B.Th.U. per day some 35 gal. of hot water was available for use—*i.e.*, 250 gal. per week. The total fuel cost would be 7s., the cost for water being approximately 1s. 9d. In Government-sponsored property it was unlikely that the whole of the hot water heating would be given to gas. In such property the use of gas was likely to be confined to summer water heating, and therefore the capital cost of the gas appliance and the degree of complication of the hot water system necessitated by the use of gas was of vital importance. It was important that the industry should give special attention to methods of water heating which could form simple and cheap adjuncts of a solid fuel system.

The author had mentioned gas conversion sets for a back boiler and coke boiler. There was the other method of applying gas heating direct to the storage tank by means of some form of direct heater or immersion heater, thus producing a simple gas storage heater. This method would avoid heat losses from flow and return pipes and enable thermostatic control to be applied ; it would also bring gas equipment into closer relation to the electric immersion heater, which was already well established for summer hot water. In considering costs, it must be remembered that the gas industry owed its position largely to the greater convenience of gas compared with other fuels, rather than to lower costs. The public would always pay for convenience, and that must be borne in mind when comparing different gas installations.

Simplification Needed

It was well to draw attention to the high cost of special exterior shapes and finishes and of the elaborate controls and safety devices now fitted. Radical simplification was essential if costs were to be kept down. In that connection the lower cost of a volumetric governor compared with a pressure governor was worthy of consideration. In connection with installation costs Mr. Purkis had mentioned the balanced flue, to which much attention was now being given. A satisfactory balanced flue should have many advantages on a water heater, in particular the increased safety due to the fact that no products of combustion could enter the room. He questioned, however, whether the fitting of a balanced flue with the necessary modifications to the heater itself would be cheaper than, or as cheap as, the average existing installation of heater and normal flue; it might be cheaper in those cases where it would otherwise be necessary to make a particularly elaborate flue arrangement.

Attention had been drawn to the seriousness of corrosion as a factor in maintenance, a subject in which they had taken some interest at Old Kent Road. Those concerned with problems of utilisation could, he thought justifiably, look to the production side to produce a gas of lower sulphur content. Their work at Old Kent Road showed clearly that the degree of corrosion of heaters was directly proportional to the sulphur content of the gas. He had been concerned in some of the work on sulphur removal and was convinced that the problem could be solved, and although any sulphur removal process would increase production costs, this would be offset at least in part by the reduced cost of district maintenance and by the less tangible advantage of an improved standard of service generally. The same remark applied to the presence of gum in distributed gas. Gum could be avoided by suitable methods of purification and the presence or absence of gum should be one of the factors taken into account when purification costs were being considered.

The test procedure developed at Watson House for simulating domestic conditions was interesting, and doubtless the author would be the first to agree that figures obtained from such a procedure must be interpreted with reserve since the habits of consumers varied so widely and an installation which provided hot water very cheaply under one set of conditions might not be the cheapest for another set of conditions. An important point brought out at Watson House was that under most conditions the amount of gas used for heating the appliance, dead leg loss, and maintenance was always high, and in the case of some installations could be much greater than the amount of gas usefully consumed. Maintenance losses were one of the most serious drawbacks of the storage type of heater. At Old Kent Road they had experimented with a snap action thermostat in the storage tank which shut off the gas supply completely, including the pilot, when the storage tank was heated to the required level. Twenty gal. of water per day at 140° F. could be obtained with as little as a quarter of a therm and with an additional 20 gal. on each of two days the total requirement would be only two therms.

Experience at Abbots Langley

Dr. **Weston** (Building Research Station) commented that the fuel consumption to provide 150-200 gal. of hot water per week by means of a storage heater was very much the same as for an instantaneous heater. Although the Egerton report recommended a standard of 200 gal. it did not follow that everybody would use that quantity. Experience at Abbots Langley showed differences in consumption related to different methods of water heating. In houses with solid fuel boilers the winter consumption averaged about 230 gal. at 140° F., while the tenants of houses equipped with electric immersion heaters consumed only 170 gal. at 140° F. in the summer. With electric heaters an increase in water consumption brought about a proportional increase in fuel cost, but with a solid fuel appliance the increase was very slight. As a result of investigations at Abbots Langley it had been concluded that in the case of a small house the ideal arrangement was to provide for space heating and water heating from a single solid fuel appliance. That brought them to the question of the finned backed boiler versus the bath heater for summer use, and he felt Mr. Purkis was right in stating the need for a cheap additional attachment for the finned back boiler in the summer. The gas industry would do well to investigate the possibilities of such an attachment. The open fire with the back boiler was going to be a very common method of heating water in the small houses of the future.

An Important Potential Load

Mr. **G. C. Holliday** (Watson House) said the paper demonstrated the importance of carrying out practical usage tests on complete hot water installations and of reproducing as far as possible in the laboratory the way in which an installation would be used in the home. Striking economies in running costs were shown to be possible which might never have been realised if laboratory work had been confined solely to appliance bench efficiency tests. It used to be said that gas appliances had reached the practicable limit of efficiency, but what had been done during and since the war had shown that it was not true either of appliances or installations. The author had indicated potential savings in consumption

for storage water heating of 15% by doing this, 25% by doing that, and similarly they had seen quite substantial reductions in consumptions on new designs of wash boilers, gas fires, cookers, grills, and kettles.

Water heating, especially summer water heating, represented an important potential load for the gas industry and no effort should be spared to obtain it. Every housewife who used solid fuel in the winter would welcome a labour-saving alternative in the summer. Gas could provide a speedy service of, say, 150 gal. at 140° F. per week for 2½-3 therms at low running costs. On fuel cost alone full price gas was about competitive with the most efficient electrical methods with current at ¾d. a unit; cheaper than electricity at 1d. a unit; and in general gas was as cheap or cheaper than solid fuel when used in summer.

Capital cost was probably the most serious deterrent to the extended use of gas water heating, and it remained a mystery to him why purchase tax had been imposed on gas water heaters when their extended use would show considerable savings of the nation's coal. The problem of obtaining the gas water heating load in new houses was different from that in existing houses. In new houses, most of which were being built by local authorities, some saving could be made on installation costs if it was decided to include gas water heating from the start. If the finned back boiler was installed for winter use the cost, without purchase tax, of a gas attachment and sink heater would be under £10. In case the provision of summer water heating was left to the tenant every effort should be made to persuade the architect to install the combined wall ventilator and flue, or suitable aperture for a balanced flue appliance in both kitchen and bathroom. There would then be three alternative gas water heating methods available at reduced installation cost: (1) sink heater and gas attachment if finned boiler was used; (2) instantaneous multi-point or circulator in kitchen; (3) sink heater in kitchen and bath heater in bathroom.

Regarding the use of gas and coke combinations generally in new houses he was sure Dr. Weston would not disagree with him if he drew attention to the fact that a house at Abbots Langley with a coke fire and gas summer water heating had a very low and probably the lowest fuel consumption and coal requirement of all the houses on the estate. Alternative and more modern gas and coke appliances were being installed in some of the houses and he looked forward with interest to the results.

The Sulphur Bugbear

Mr. **J. E. Cooper** (Thomas De La Rue & Co., Ltd., Potterton Gas Division—and formerly of Watson House) congratulated the laboratory people on having, in co-operation with the commercial and market research divisions, given a complete picture of the true cost of water heating by gas, using various systems and bearing in mind overall or practical efficiencies when using gas appliances with small draw-offs. In pre-war days they found that when they drew off a half pint of water from a multipoint heater the overall efficiency was down to 4%. It was gratifying to know that a standard method of test had been laid down. They all wished to see an increase in the water heating load, for which they were in competition with electricity; there was, he thought, almost universal agreement that electricity ought not to be used for water heating. The overall cost tables would have been more complete had there been added comparable figures for their chief competitor on the electrical side—the under-draining-board heater and the 3 kW immersion heater. With regard to corrosion the real problem of maintenance was not on the district, but at the works, and it had been there for 40 years or more. Many years ago they had a slogan 'Sulphur must go' but it seemed to him to 'go' in increasing quantities as the years passed. Obviously the design of appliances must be maintained but improvements in that sphere were limited by the need to apply protective coatings. If sulphur went, he suggested that the gas industry might then be prepared to consider the evolution of a low gas rate water heater as a means of reducing the present overall costs.

Dr. **R. Jessell** (Nash & Thompson, Ltd., associated with Ascot Gas Water Heaters, Ltd.) said he was not impressed by the method of test based on a 'programme' because after a whole week's work, which usually had to be repeated in the following week, one arrived at a figure based only on that particular 'programme.' Someone else came along and proved that it was a wrong programme, and in the end the results were of very litte practical value. He suggested that what was wanted was a series of figures representing the efficiency of the appliance under certain practical conditions, indicating, for instance, the intervals between drawing off. Much had been said about low maintenance costs, but he suggested the possibility that a cheap appliance involving a slightly higher maintenance cost might be no more expensive in the long run. It was an open question whether the industry created more consumer goodwill by maintaining an appliance only once in three years than by sending a man round at much shorter intervals and creating in the mind of the consumer the sense that he was being well looked after. He was struck by the high cost of storage water heaters and he questioned whether it was right to pay so much attention to a high recovery rate.

Mr. **Blandon** (Watson House) said the programme indicated in the paper was drawn up as an outcome of the paper presented two or three years ago by Andrew, Dunning, and Holliday. The groundwork was laid by one of the laboratory staff who had also had some district experience. Capital (installation) costs today were 2½ times higher than the estimated figures for 1939, but the maintenance cost was scarcely any greater, due, he thought, to the realisation in the war years that a reasonable standard of efficiency could be maintained with visits at much less frequent intervals. The standard price of gas was taken in 1939 as 9d. per therm, against the 15.6d. per therm ruling today, and he thought the supply industry might well ask the manufacturers why their costs had gone up 2½ times while the costs on the supply side had less than doubled.

Flexibility Essential

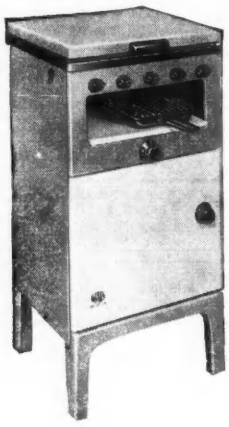
Mr. **A. Blum** (Ewart & Son, Ltd.) said that whenever he had to discuss water heating problems with planning authorities he found their notions were essentially influenced by the Egerton report and by figures from the United States, so that 250 gal. per week was regarded as fair and something like 350 gal. as a really desirable level. Against such figures, the 70 gal. found statistically presented a sounder starting point for economic planning and assessment of hot water costs. It was realised now that the hot water demand was only a fraction of what it had been assumed to be, and the average was made up from widely varying individual figures which could not be predicted with any degree of accuracy. As most building today was done in large units, and only to a negligible degree by the user, it followed that the demand was for a very elastic system of hot water supply working with a reasonable efficiency even with a small load; at the same time it must be capable of providing a delivery of, say, 10 times the 'average minimum' without much bother. It would seem therefore that in the majority of cases instantaneous heaters, probably in the combination of sink heater plus bath heater, would be the most universally applicable system.

Much as he preferred a storage heater with high recovery rate he could not see how it came into the picture as presented in the paper. In over 20 years of research in several countries he had reached the simple conclusion that an independent storage water heater came into the range of consideration, at equal price of gas per therm, when its contents were used up at least once per day, and would draw level with instantaneous installations when its average daily load equalled twice its contents. Such a principle was reasonably in agreement with Mr. Purkis's figures and also with those of the Building Research Station. The smallest suitable storage heater would have at least 15-20 gal. capacity; thus it could be considered for a minimum weekly delivery of 100-140 gal. where the consumer was prepared to pay a fair price for quick service, and for a delivery of 200-300 gal. where regard must be had to costs. Comparing these figures with the author's average of 70 gal. he could not see that even improved types of storage heaters could be used generally, especially as it could not be presumed that the authorities would promote the habits which they had so energetically fought through many years by the continued infliction of purchase tax.

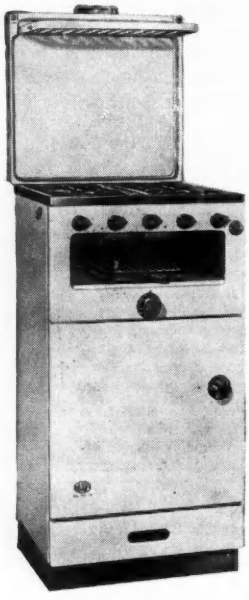
While in theory he agreed that a built-in geyser was ideal, in practice he felt it was something of a nuisance. Were they doing well in getting architects used to the notion that geysers ought to be made to measure, instead of being more or less standard units. The gas industry had been playing with that idea for some years and he wondered where it was leading. It would be interesting to have even a rough estimate of the number of built-in geysers in actual use. Regarding technical details, his company's experience covered almost everything Mr. Purkis had said. This applied particularly to the burner question. As a Continental, he was born and bred to the pinhole burner and when he joined his present firm one of his first notions was to replace the jet burner with a pinhole burner. A few months' study convinced him of the superiority of the jet burner under English conditions.

Mr. **Stirling Everard** (Manager, Market Research, North Thames Gas Board) spoke of a survey in which information had been obtained from one in 40 of the 1,170,000 consumers in the Gas Light area. The incomes of many consumers were extremely restricted and were likely to become more so. Many economies in regard to gas utilisation were due to sheer inability to pay for

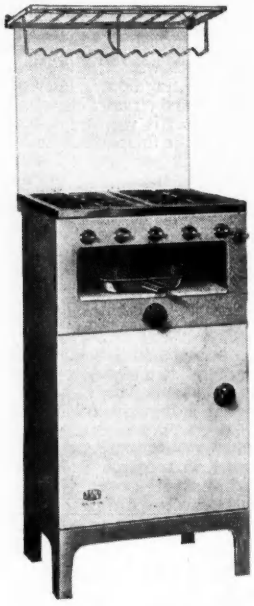
choice is one of the main features



177 with hinged cover closed; 3 boiling burner hotplate; 14" oven; cast iron legs; dapple/white finish.



177 with hinged cover and shelf; 4 boiling burner hotplate; 16" oven; plinth base; cream/black finish.



177 with platerack and backplate; 4 boiling burner hotplate; 16" oven; cast iron legs; dapple/white finish.

177 with short splashplate; 3 boiling burner hotplate; 16" oven; tubular legs; cream finish.

MAIN 177 GAS COOKER

WITH A CHOICE OF INTERCHANGEABLE FEATURES

the service. The growing capital cost of appliances was a serious matter. The demand was there, but not the money to satisfy it. There were something like half a million consumers who had no water heating system whatever, partly due to the fact that large houses latterly converted into flats started with nothing more than a coal range in the basement, and no effort had been made to provide the tenants with modern facilities.

Mr. **Duncan Wills** (Watson House) recalled that before market research was taken seriously in hand he was engaged in a survey which revealed an average weekly consumption of only 70 gal. of hot water. Investigating social conditions they found that many households had no such thing as an 'A' or 'B' day. There was an occasional day when father, mother, and the whole family took a single bath, the same water afterwards being used for part of the family laundry. He suggested that the market should be studied more socially and that they should avoid trying to sell expensive appliances where they were beyond the consumer's means.

Mr. **Hench** (Barralets, Ltd.), referring to the question of finish, said his company had carried out a series of experiments but had been forced back to the existing arduous and expensive method of enamelling. His own experience in connection with gas circulators was that gas bills had been high, largely because lagging had been ignored.

Mr. **F. O. Hawes** (Tottenham Division, Eastern Gas Board) related some early experiences in the area of the old Tottenham undertaking in which storage heaters were installed on the basis of a fixed quarterly charge, with gas included. Consumptions of up to 50 gal. per day were recorded.

Mr. **L. W. Andrew** (Watson House) suggested that Mr. Purkis should look again at his four objectives from the point of view of the man who at present had only solid fuel; the man who wanted good service at lower running costs; and the man who was prepared to pay a slightly higher capital cost to get the best service that gas could offer.

Mr. **Purkis,** in a brief reply, said he agreed with some of the speakers that if water heating appliances were to be used as intermittently as some had suggested the industry might have to reconsider its ideas on design. On the question of sulphur, he had to take the position as he found it, but he hoped Mr. Cooper and others would persist in their efforts to secure its removal. He agreed that water heating systems should be as elastic as possible. The figures given by Mr. Everard gave them a picture of the big task in front of them. Dealing with costs he pointed out that the capital plus installation cost of the conversion set which he had suggested would be rather less than that of an immersion heater, and the capital plus installation cost of the very best independent storage heater would be rather less than that of the under-draining-board heater. The running costs of gas appliances would compare favourably with electricity at ¾d. a unit.

A vote of thanks was accorded to the author on the proposition of Mr. **T. V. Garrud** (North Thames Gas Board).

DISPOSAL OF EFFLUENTS

THE Water Pollution Research Board of the D.S.I.R. has now published its report covering the year 1948.

The Chairman of the Board, Mr. H. W. Cremer, says in the introduction to the report that towards the end of the year the Lord President of the Council asked the Board to review in detail the programme of work of the Water Pollution Research Laboratory and to consider whether the resources available were being used to the best advantage of the nation at the present time. Careful consideration showed that no major changes could be suggested in the programme of work which would add to its usefulness. Although the work of the laboratory does not directly lead to greater industrial productivity, much of the work is designed to reduce the capital cost and the costs of operation of the great number of engineering works of different kinds which the effective disposal and treatment of waste liquids require.

The Chairman devotes a section of his remarks to the treatment of sewage containing spent gas liquor. In most towns, he points out, the liquor which is produced in the process of purifying coal gas, containing a wide variety of organic and inorganic substances, is discharged to the domestic sewers. With the exception of ammonia, no process has so far come into general practice for removing these constituents. This liquor in domestic sewage can be treated by the processes ordinarily employed at a sewage-disposal works, but it often gives rise to some difficulty in treatment, particularly where the area covered by the gasworks is larger than that served by the sewage-disposal works or where large quantities of gas are used for industrial purposes.

This particular problem, has, of course, been examined in some detail by the Institution of Gas Engineers, who studied the effect of various types of liquor on the treatment of sewage and who recommended, where practicable, certain modifications in the processes employed at a gasworks which would have the effect of reducing the quantities of more troublesome substances, particularly higher tar acids and thiocyanates, in the gas liquor. The Chairman reports that as yet these modifications have not been widely adopted 'though they are in use at one works and are proving very successful.' The board decided during the year to recommend that some additional work should be done to determine quantitatively the effect on the treatment of sewage of liquors of the kind normally discharged from a gasworks, and of liquors resulting from the processes of purification of gas recommended by the I.G.E. This work, which is being undertaken in collaboration with the Liquor Effluents and Ammonia Committee of the Institution, was started approximately a year ago, and a brief summary of the results of the first few months of research is as follows.

The full-scale filtration plant, which is at Stivichall, Coventry, and which treats an average dry-weather flow of about 13,500 gal., was placed at the disposal of the laboratory by the City Engineer of Coventry and experiments were begun in December, 1947. The sewage reaching the works at Stivichall is entirely domestic in origin and is treated by sedimentation in two rectangular horizontal flow tanks, followed by biological filtration in two circular filters in parallel.

For several months no spent liquor was added to the sewage treated in the filters, and analysis showed that the effluent produced was consistent in composition and of high quality. During this period adjustments were made to ensure that, as far as possible, the flow from the dosing chamber was equally divided between the filters.

The apparatus for controlling the addition of the liquor includes a storage container, from which liquor flows through a standard orifice to the sewage feed-pipe; the flow to the orifice is controlled by a valve actuated by a solenoid, and to ensure that spent liquor is added only when settled sewage is passing to the filter, the solenoid valve is controlled by a float-operated electric switch in the siphon chamber.

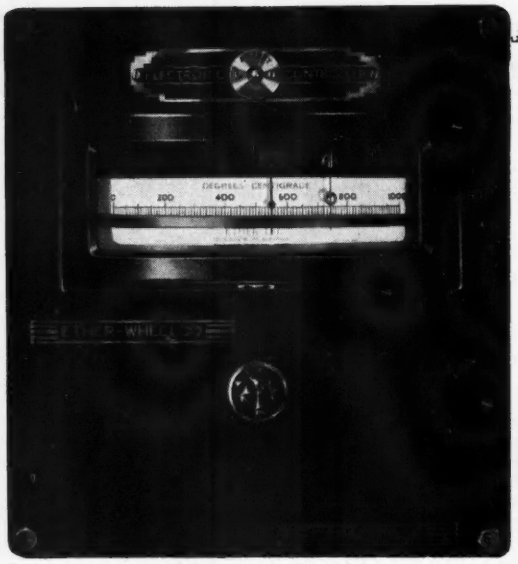
Addition of spent gas liquor to the sewage treated in Filter B was begun on April 8, 1948. Until May 31 the concentration of liquor added to the sewage was 0.1% (by volume) and during this period there was little difference between the effluents from the two filters. On June 1 the proportion of spent liquor was increased to 0.25% with, as a result, only a slight deterioration in the quality of the effluent.

During this experiment alterations were made to the filters which, receiving sewage at about 30 gal. per cu. yard per day, were considerably under-loaded. The rate was increased to about 60 gal. The capacity of the dosing chamber was also reduced so that the intervals between successive discharges of sewage to the filters were reduced from about 25 min. to about 5 min. during the day.

When these changes had been made the treatment of sewage containing 0.25% spent gas liquor was continued and no significant change was found in the quality of the effluent. At the end of September the concentration of spent liquor in the sewage treated in Filter B was increased to 0.4% by volume. This caused some deterioration in the quality of the effluent. In general only very small quantities of thiocyanate were present in the effluent and the intensity of colour was not increased by increase of the concentration of gas liquor to 0.4%.

The concentration of spent gas liquor added to the sewage has now been increased to 0.5% and will be kept at this level for some time.

Samples of the spent gas liquor used in these experiments have been examined regularly in the Gas Research Laboratory at Leeds University.



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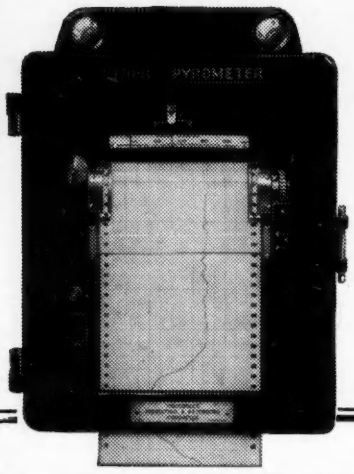

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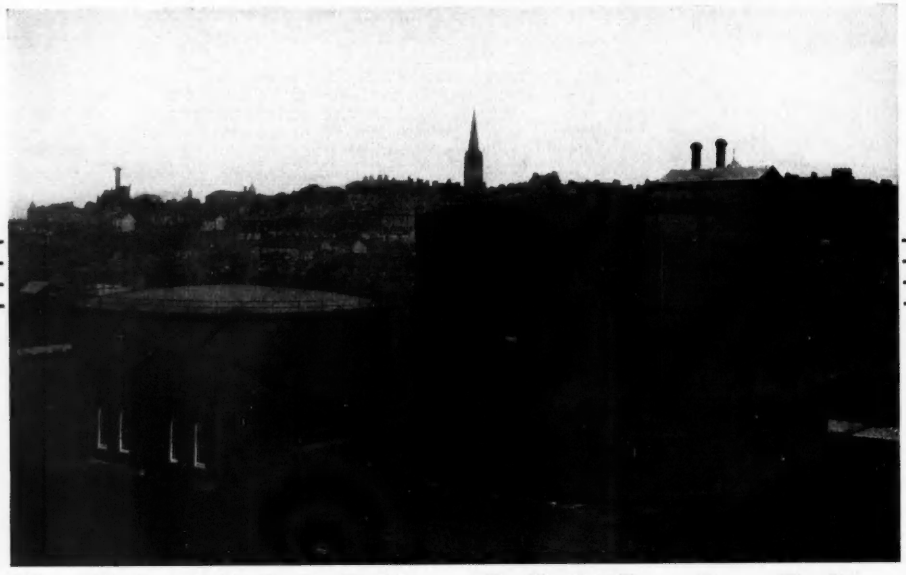

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